

101-20-1

S/S May 73

Reference

FM 101-20-1

FIELD MANUAL

UNITED STATES ARMY AVIATION PLANNING MANUAL

HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1971

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FOREWORD

This manual is published in accordance with the provisions of AR 95-70 and contains official U.S. Army aviation factors data in a single-source document to be used as a planning guide ONLY. The factors, when used with other Army program documents (e.g., Army Materiel Plan and Materiel Annex Part II to 5 Year Force Structure and U.S. Army Aircraft Standard Avionics/Surveillance Configuration, 5 Year Plan Requirement), will assist commanders, planners, and programmers in establishing a basis for operational, logistical, materiel, personnel, estimates, and the cost requirements for combat readiness of all types and models of Army aircraft. In the event such Army program documents, as mentioned above, indicate later revision, such revisions will take precedence. The data may be used in the preparation of estimates by major commands (theatre, field army, or equivalent) but will not be used as a basis of reporting cost or other data.

These planning factors were developed from diversified operational and logistical statistical data and were obtained from various Department of the Army staff offices and other Army agencies having primary responsibilities for the specific mission activities or related functions.

This manual is published in looseleaf form to facilitate insertion of revisions, changes, and/or additions. Each set of published planning factors will

be revised annually to ensure current and accurate data, as well as provide additional factors of interest. AMC is responsible for coordinating pertinent planning factors with the appropriate Army staff agency.

Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text. Reasons should be provided for each comment to ensure understanding and full evaluation. Comments should be forwarded direct to Headquarters, U.S. Army Materiel Command, Research, Development and Engineering Directorate, Attn: AMCRD-F, Washington, D.C., 20315.

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NOTE

This publication is printed in two parts. FM 101-20-1 (PART I) is classified FOR OFFICIAL USE ONLY. FM 101-20-2 (PART II) is classified CONFIDENTIAL. Pages 2-57, 2-58, 2-63, 2-64, 2-83/2-84; Chapter 3, and Chapter 5 are contained in FM 101-20-2.

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FIELD MANUAL }
No. 101-20-1 }

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DEPARTMENT OF THE ARMY
Washington, D. C., 28 September 1971

UNITED STATES ARMY
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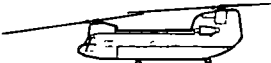
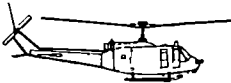
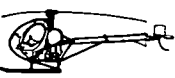
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*This manual, together with FM 101-20-2, 28 September 1971, supersedes FM 101-20, 14 August 1970.

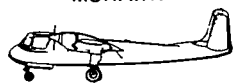
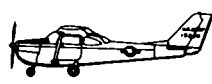
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CLASSES OF ARMY AIRCRAFT

PRE-FERRED	POPULAR NAME AND TYPE	COMBAT ACCEPT SUBST	TRAINING ACCEPT SUBST	LONG-RANGE FOLLOW-ON AFTER FY 73
AH-1G	COBRA  ATTACK HELICOPTER	UH-1B UH-1C		
CH-47	CHINOOK  CARGO TRANSPORT HELICOPTER (MEDIUM LIFT)			LIGHT TACTICAL TRANSPORT SYSTEM
CH-54A	TARHE  CARGO TRANSPORT HELICOPTER			HEAVY LIFT HELICOPTER
OH-6A OR OH-58A	CAYUSE  KIOWA  LIGHT OBSERVATION HELICOPTER	OH-13 OH-23	OH-13 OH-23	AARS (AERIAL ARMORED RECONNAISSANCE SYSTEM)
UH-1D/H	IROQUOIS  UTILITY (UTILITY/TACTICAL) TRANSPORT HELICOPTER	UH-1B CH-34C		UTILITY TACTICAL TRANSPORT AIRCRAFT SYSTEM
TH-13T	SIOUX  BASIC INSTRUMENT TRAINER HELICOPTER			OFF-THE-SHELF
TH-55A	OSAGE  PRIMARY TRAINER HELICOPTER		OH-23	OFF-THE-SHELF

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CLASSES OF ARMY AIRCRAFT

PRE-FERRED	POPULAR NAME AND TYPE	COMBAT ACCEPT SUBST	TRAINING ACCEPT SUBST	LONG-RANGE FOLLOW-ON AFTER FY 73
U-8F	SEMINOLE  UTILITY AIRPLANE	U-8D U-1A U-6A		
U-10A	COURIER  UTILITY STOL AIRPLANE (SPECIAL FORCES AIRCRAFT)			
U-21	UTE  UTILITY AIRPLANE	U-8D		
OV-1	MOHAWK  OBSERVATION STOL AIRPLANE			MANNED AERIAL VEHICLE/ SURVEILLANCE
T-41B	MESCALERO  FLIGHT TRAINER AIRPLANE		O-1	OFF-THE-SHELF
T-42A	COCHISE  INSTRUMENT TRAINER AIRPLANE		U-6A O-1D	OFF-THE-SHELF

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CHAPTER 1

OPERATIONS

Section I AIRCRAFT AUTHORIZATIONS

Aircraft authorizations are listed by TOE unit authorizations. The current Major Item Analysis (Data Sheets) contains details concerning authorizations for specific areas or commands.

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1-1. Basis of Issue — Aircraft Authorization per Unit.

UNIT			TOE	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	CH-54	OV-1B	OV-1C	U-21	U-10
Armored Division	RECAP		17	64	42	9	13						
*HHB, Div Arty			6-302	(14)	(14)								
HHC, Armd Bde (3)			17-42	(12)	(12)								
Avn Co, Armd Div			17-87	(10)	(6)		4						
Armd Cav Sqdn	RECAP		17-105	27	10	9	8						
*Air Cav Trp			17-108	(27)	(10)	(9)	(8)						
Maint Bn	RECAP		29-35	1			1						
*Acft Maint Co			55-424	(1)			(1)						
Mechanized Division	RECAP		37	64	42	9	13						
*HHB, Div Arty			6-302	(14)	(14)								
Armd Cav Sqdn	RECAP		17-105	27	10	9	8						
*Air Cav Trp			17-108	(27)	(10)	(9)	(8)						
Maint Bn	RECAP		29-25	1			1						
*Acft Maint Co			55-424	(1)			(1)						
HHC, Mech Bde (3)			37-42	(12)	(12)								
Avn Co, Mech Div			37-87	(10)	(6)		(4)						
Infantry Division (Active)	RECAP		7	160	62	33	65						
*HHB, Div Arty			6-302	(14)	(14)								
*HHC, Inf Bde (3)			7-42	(18)	(12)		(6)						
Avn Bn, Inf Div	RECAP		7-75	42	6	6	30						
*Aslt Hel Co			7-77	(29)		(6)	(23)						
*Avn GS Co			7-78	(13)	(6)		(7)						
Air Cav Sqdn	RECAP		17-205	85	30	27	28						
*HHT, Air Cav Sqdn			17-206	(4)			(4)						
*Air Cav Trp (3)			17-208	(81)	(30)	(27)	(24)						
Maint Bn	RECAP		29-15	1			1						
*Acft Maint Co			55-89	(1)			(1)						
Infantry Division (Reserve)	RECAP ^{1/}		7	102	42	15	45						
*HHB, Div Arty			6-302	(14)	(14)								
*HHC, Inf Bde (3)			7-42	(18)	(12)		(6)						
Avn Bn, Inf Div	RECAP		7-75	42	6	6	30						
*Aslt Hel Co			7-77	(29)		(6)	(23)						
*Avn GS Co			7-78	(13)	(6)		(7)						
Armd Cav Sqdn	RECAP		17-105	27	10	9	8						

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1-1. Basis of Issue — Aircraft Authorization per Unit (CONT).

UNIT	TOE	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	CH-54	OV-1B	OV-1C	U-21	U-10
*Air Cav Trp	17-108	(27)	(10)	(9)	(8)						
Maint Bn	29-15	1			1						
*Acft Maint Co	55-89	(1)			(1)						
Airborne Division	57-	160	62	33	65						
*HHB, Div Arty	6-201	(14)	(14)								
Air Cav Sqdn	17-275	85	30	27	28						
*HHT, Air Cav Sqdn	17-276	(4)			(4)						
*Air Cav Trp (3)	17-278	(81)	(30)	(27)	(24)						
Maint Bn	29-55	1			1						
*Acft Maint Co	55-99	(1)			(1)						
*HHC, Abn Div Bde (3)	57-42	(18)	(12)		(6)						
Avn Bn, Abn Div	57-55	42	6	6	30						
*Aslt Hel Co	57-57	(29)		(6)	(23)						
*Avn GS Co	57-58	(13)	(6)		(7)						

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1-1. Basis of Issue – Aircraft Authorization per Unit (CONT).

UNIT		TOE	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	CH-54	OV-1B	OV-1C	U-21	STANO UH-1M	U-10
Airmobile Division	RECAP	67	422	88	87	193	48					6	
Div Arty	RECAP	6-700	58	16	36	6							
*Avn Btry (Div Arty)		6-702	(19)	(16)		(3)							
FA Bn Aerial Arty	RECAP	6-725	39		36	3							
H&S Btry, Aerial Arty		6-726	(3)			(3)							
Arty Btry, Aer Arty (3)		6-727	(36)		(36)								
Avn Gp	RECAP	7-200	226	16	24	132	48					6	
Aslt Spt Hel Bn	RECAP	1-165	50			2	48						
*HHC, Aslt Spt Hel Bn		1-166	(2)			(2)							
Aslt Spt Hel Co (3)		1-167	(48)				(48)						
*Avn Co (GS)		7-202	(26)	(10)		(10)						(6)	
Aslt Hel Bn (2)	RECAP	7-255	150	6	24	120							
HHC, Aslt Hel Bn (2)		7-256	(6)	(6)									
Atk Hel Co (2)		7-257	(24)		(24)								
Aslt Hel Co (6)		7-258	(120)			(120)							
Med Bn	RECAP	8-25	12			12							
HHC, Med Bn		8-26	(12)			(12)							
Air Cav Sqdn	RECAP	17-95	85	30	27	28							
*HHT, Air Cav Sqdn		17-96	(4)			(4)							
Air Cav Trp (3)		17-98	(81)	(30)	(27)	(24)							
TC Bn, Acft Maint	RECAP	55-405	5	2		3							
HHC, TC M&S Bn		55-406	(1)			(1)							
Acft Maint Co (2)		55-407	(4)	(2)		(2)							
*HHC, Ambl Div Bde (3)		67-42	(36)	(24)		(12)							

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1-1 Basis of Issue — Aircraft Authorization per Unit (CONT).

UNIT	TOE	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	CH-54	OV-1B	OV-1C	U-21	U-10
TRICAP Division	RECAP	330	80	99	135	16					
HHB, Div Arty		6-302 (11)	(9)		(2)						
HHC, Armd Bde (2)		17-42 (8)	(8)								
Avn Bn	RECAP	17-145 114	6	18	74	16					
HHC, Avn Bn		7-76									
Aslt Spt Hel Co		1-258 (17)			(1)	(16)					
Aslt Hel Co (3)		7-357 (87)		(18)	(69)						
Avn Co (GS)		17-87 (10)	(6)		(4)						
Armd Cav Sqdn	RECAP	17-105 26	9	9	8						
Air Cav Trp		17-108 (26)	(9)	(9)	(8)						
Air Cav Atk Sqdn	RECAP	17-185 71	10	45	16						
HHT, Air Cav Atk Sqdn		17-186 (17)	(10)		(7)						
Atk Hel Co (3)		17-187 (54)		(45)	(9)						
Air Cav Sqdn	RECAP	17-175 85	30	27	28						
HHT, Air Cav Sqdn		17-196 (4)			(4)						
Air Cav Trp		17-198 (81)	(30)	(27)	(24)						
Maint Bn	RECAP	29-35 2			2						
Acft Maint Co		55-424 (2)			(2)						
HHC, Ambl Bde		67-42 (13)	(8)		(5)						
Separate Brigades											
*HHC, Inf Bde (Sep)		7-102 11	8		3						
*HHC, Armd Bde (Sep)		17-102 8	6		2						
*HHC, Mech Bde (Sep)		37-102 8	6		2						
*HHC, Abn Bde (Sep)		57-102 11	8		3						
*HHC, Light Inf Bde		77-102 11	8		3						

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1-1. Basis of Issue — Aircraft Authorization per Unit (CONT).

UNIT	TOE	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	CH-54	OV-1B	OV-1C	U-21	U-10
Armored Cavalry Regiment	RECAP 17-51	49	18	9	22						
HHT, Armd Cav Regt	17-52	(10)	(2)		(8)						
HHT, Cav Sqdn (3)	17-56	(12)	(6)		(6)						
*Air Cav Trp	17-58	(27)	(10)	(9)	(8)						
Air Cav Sqdn (Separate)	RECAP 17-195	85	30	27	28						
*HHT, Cav Sqdn	17-196	(4)			(4)						
Air Cav Trp (3)	17-198	(81)	(30)	(27)	(24)						
Avn Bde, HHC	1-66	8	2		4					2	
*Avn Co, Corps	1-127	10	4		5					1	
*Avn Co, Army	1-137	13	3		5					5	
Recon Hel Co	1-177	32	32								
*Air Traffic Control	1-207	5	2							3	
Avn Gp, HHC	1-252	5	3		2						
Avn Bn, HHC	1-256	2			2						
Avn Co, Aslt Spt Hel	1-258	17			1	16					
Avn Operating Teams	1-500	9	1	1	1	1	1	1	1	1	1
*Engr Cbt Bn, Army/Corps	RECAP 5-35	2	1		1						
HHC, Engr Cbt Bn	5-36	(2)	(1)		(1)						
*Engr Cbt Gp, HHC	5-52	2	2								

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1-1. Basis of Issue — Aircraft Authorization per Unit (CONT).

UNIT	TOE	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	CH-54	OV-1B	OV-1C	U-21	U-10
Engr Cbt Bde, HHC	5-101	3	2		1						
Engr Const Bde, HHC	5-111	3	2		1						
Engr Const Gp, HHC	5-112	5	4		1						
*Engr Comd, HHC	5-201	5	2		2					1	
*Engr TOPO Co, Corps	5-327	1			1						
*Engr Base Survey Co	5-348	4	2		2						
HHB, Field Arty Gp	6-401	6	6								
HHB, Corps Arty	6-501	2	2								
HHB, Abn Corps Arty	6-502	2	2								
HHB, FA Bde (Pershing)	6-604	6	6								
Field Arty Bn (Pershing)	RECAP 6-615	4			4						
HHB, FA Bn (Pershing)	6-616	(4)			(4)						
<u>Avn Co, Aslt Hel — Separate</u>	7-357	29		6	23						
<u>Med Co, Air Ambulance</u>	8-137	25			25						
Med Det, Hel Ambulance (RC) ..	8-660	2			2						
Med Det, Hel Ambulance (RA) ..	8-660	6			6						
Corps Signal Bn	RECAP 11-15	6	1		5						
HHC, Corps Sig Bn	11-16	(6)	(1)		(5)						

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1-1. Basis of Issue — Aircraft Authorization per Unit (CONT).

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UNIT	TOE	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	CH-54	OV-1B	OV-1C	U-21	U-10
Signal Const Bn	RECAP 11-25	4	4								
*HHC, Sig Const Bn	11-26	(4)	(4)								
Signal Cable Const Bn	RECAP 11-45	3	3								
*HHC, Sig Cable Const Bn	11-46	(3)	(3)								
Army Comd Sig Rdo/Cable Bn ..	RECAP 11-75	3	2		1						
*HHC, Army Comd Sig Rdo/Cab Bn	11-76	(3)	(2)		(1)						
Army Area Sig Bn	RECAP 11-85	1	1								
*HHC Sig Army Area Bn	11-86	(1)	(1)								
Army Comd Sig Op Bn	RECAP 11-95	9	2		5					2	
*HHC, Army Comd Sig Op Bn	11-96	(9)	(2)		(5)					(2)	
*HHC Sig Bde, Army	11-102	3			2					1	
HHD, Sig Bn	11-116	1	1								
*HHD, Sig Gp, Army	11-122	4	2		1					1	
Abn Corps, Sig Bn	RECAP 11-225	6	1		5						
HHC, Sig Bn, Abn Corps	11-226	(6)	(1)		(5)						
HHC, USA Strategic Command ..	11-302	1								1	
*Sig Co, Msgr	11-358	7			2					5	
Sig Radio Relay Co	11-377	1			1						
*Avn Co, Atk Hel	17-111	23		21	2						

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1-1. Basis of Issue — Aircraft Authorization per Unit (CONT).

UNIT	TOE	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	OV-1B	OV-1C	OV-1D	U-21	U-10
*MP Bde, HHD	19-262	2	1		1						
*MP Gp, HHD	19-272	5	3		2						
*Scout Organization	20-500	2			1					1	
MI Bn, Air Recon Spt (MIBARS)	RECAP 30-5	5								5	
HHC, MI Bn, Air Recon Spt	30-6	(5)								(5)	
MI Co, Aerial Survl	30-79	18							18		
Avn Co, Survl Airplane	30-128	18					6	12			
Abn Spec Forces Gp	RECAP 31-101	6	4								2
Spec Forces Spt Bn	RECAP 31-125	(6)	(4)								(2)
HHC, Spec Forces Spt Bn ..	31-126	(6)	(4)								(2)
*ASA Gp Field Army	32-52	12	9							3	
*ASA Co Div Spt	32-57	3			3 ^{2/}						
*ASA Avn Co (ELIS)	32-59	15								15 ^{2/}	
ASA Avn Co (EW)	32-97	9								9 ^{2/}	
Ms1 Comd (Air Trans)	39-52	4	2		2						
*ADA Bde, HHB	44-2	3	1		1					1	

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1-1. Basis of Issue – Aircraft Authorization per Unit (CONT).

UNIT	TOE	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	CH-54	OV-1B	OV-1C	U-21	U-10
ADA Gp, HHB	44-12	2	1		1						
*ADA Bde, HHB	44-102	2	1		1						
*ADA Gp, HHB	44-112	2	1		1						
*FASCOM, HHC	54-12	3	2							1	
*Spt Bde, HHC	54-22	2	1							1	
*Trans Mvmt Con Center, HHD ..	55-6	1			1						
*Trans Motor Trans Bde, HHC ..	55-11	1	1								
*Trans Bde, HHC (COSCOM) ...	55-62	2	2								
*Trans Tml Bde, HHC	55-111	1	1								
*Trans Tml Gp, HHC	55-112	1	1								
*Trans Rwy Gp, HHC	55-202	1	1								
Avn Co, Hvy Hel	55-259	10			1		9				
TC Co, Acft DS	55-457	2			2						
TC Co, Acft GS	55-458	3			2	1					
TC Bn, Acft Depot Maint	55-465	2			2						
HHC, Trans Acft Depot											
Maint (Seaborne)	55-466	(2)			(2)						

RECAP

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1-1. Basis of Issue – Aviation Detachment and Nonstandard BOI--Addendum ^{3/}

UNIT	UIC	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	CH-54	OV-1B	OV-1C	U-21	U-10
USAEIGHT											
3d Avn Det	WDHW	7	4		2						1
6th Avn Plat	WHMX	4						4			
52d Avn Det	WDHY	2			2						
USAJAPAN											
4th Avn Det	WG7G	3			2						1
USARSUPTHAI											
70th Avn Det	WGZL	9			2						7
USARRYUKYUI											
23d Avn Det	WE2E	6			5						1
USARV											
358th Avn Det	WG1J	6			5						1
USARHAW											
367th Avn Det	WG8H	8			4						4
USARAL											
19th Avn Bn, HHC	WAX4	7			3					2	2
90th Avn Co, ASHC	WA46	12			1	11					
236th Avn Co, ASHC	WHVC	12			1	11					
12th Avn Co, GS	WAYL	15			3			3	3	4	2
USMA											
2d Avn Det	WAY3	4			2						2
ARADCOM											
44th Avn Det	WG40	13 ^{4/}									12 ^{4/}
USARSO											
352d Avn Det	WGZM	9								3	6

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1-1. Basis of Issue — Aviation Detachment and Nonstandard BOI—Addendum^{3/}(CONT).

UNIT	UIC	TOTAL ACFT	LOH	AH-1G	UH-1H	CH-47	CH-54	OV-1B	OV-1C	U-21	U-10
USAREUR											
1st Avn Det	WAYZ	5			3					2	
22d Avn Det AWSOM	WFKA	8				8					
56th Avn Det	WAY1	7			3						4
356th Avn Det	WG1G	1	1								
357th Avn Det .. (BELGIUM)	WG1H	2			2						
SETAF											
6th Avn Det	WDHX	4			3						1

* Aircraft BOI changes from "T", "G" or "H" series TOE.

NOTE: Organic DS maintenance capability is to be provided in those units which are underlined.

^{1/} In ASOP and JSOP has same BOI as Active Infantry Division (160 aircraft).

^{2/} RU-Type aircraft.

^{3/} This addendum is provided to account for those aircraft authorizations which, in addition to the preceding BOI, are used to compute command requirements.

^{4/} One U-21 authorized to unit subordinate to ARADCOM by MTOE included here.

Source: OACSFOR

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1-2. Test and Test Support Aircraft.

Requirements for test and test support aircraft are established as follows:

a. All plans of test or development programs which require the use of aircraft for any phase will identify the specific type of aircraft required and the purpose (e.g., competitive evaluation of navigation aids in utility helicopter, air transportability of missile in cargo helicopter).

b. The agency providing test service to customers normally requires one aircraft to support two plans of test, with the following exceptions:

(1) An aircraft which is on bailment for an extended period cannot be considered as an available asset to fill additional requirements.

(2) An aircraft which has been modified to a special configuration (flying lab, ski installation) in support of a particular specialized long range R & D program may not be considered as a suitable available asset to apply against normal test and test support aircraft requirements during a given fiscal year. (However, this aircraft may become available for use in other programs in subsequent years.) Nonstandard aircraft assets shall not be considered as suitable substitutes for Army aircraft when computing test and test support aircraft requirements. Requirements should be based on use of Army-type aircraft to support Army programs. Use of nonstandard aircraft (C-47, T-28) for Army test programs will be authorized only if an Army-type aircraft cannot be made available or is not suitable for the intended purpose.

Example: A USAF jet aircraft may be necessary for missile chase at firing sites.

c. In addition to those aircraft required to support research, development, test, and evaluation, a requirement is established for allocation of additional aircraft. Three models of each new type aircraft will be procured by Department of the Army. The three aircraft will be assigned to USA Test activities and will be utilized during the service life of that particular type aircraft for service and logistical testing.

1-3. Authorized Aircraft Designations.

a. All Department of Army Aircraft have been assigned designations in accordance with provisions of AR 700-26. Explanation of terms are as follows:

(1) Status prefix symbol. The status symbol (letter), will indicate an aircraft being used for experimentation and special or service test and will be placed at the immediate left of the modified mission symbol, or the mission/type symbol if no modified mission symbol is applicable.

(2) Modified mission symbol. A letter used to indicate the current capability of an aircraft when it is so modified that its original intended capability is no longer applicable, or when it has an added or restricted capability. The modified mission symbol will consist of a prefix letter placed at the immediate left of the basic mission or type symbol. Only one modified mission symbol will be used in any one designation.

(3) Basic mission symbol. A letter used to indicate the basic intended function or capability of the aircraft, such as observation, utility, etc.

(4) Type symbol. An additional letter which designates helicopter and V/STOL aircraft. An aircraft identified by a type symbol, such as "H" for helicopter, will be further identified by only one mission symbol whether it be basic mission or a modified mission symbol. (A basic mission or type symbol, once officially assigned, will not be changed without the approval of the Assistant Secretary of Defense (Installation and Logistics)).

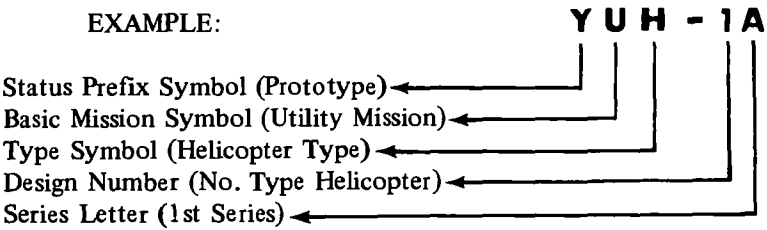
(5) Design number. The sequence number of each new design of the same basic mission or type aircraft. A number will be assigned consecutively for each basic mission or type. New design numbers will be assigned when an existing aircraft is redesigned to an extent that it no longer reflects the original configuration or capability.

(6) Series letter. A letter used to denote differences affecting the relation of the vehicle to its ground environment, and major modifications to the aircraft which result in significant changes to its logistic support. A letter will be assigned to each series change of a specific basic design. In designing new aircraft, the series letter will be in consecutive order

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starting with the letter "A." To avoid confusion, the letters "I" and "O" will not be used as series symbols. (Examples of series symbol change would be installation of different engines, propellers, extra fuel tank, etc.)

(7) Complete designation. The complete designation shall consist of items (1) through (6) as applicable, in the order shown. A dash (-) will be inserted between the basic mission/type symbol and the design number.



b. Status prefix symbols (classification letters) are as follows:

LETTER	TITLE	DESCRIPTION
G	Permanently Grounded	An aircraft permanently grounded, used for ground instruction and training.
J	Special Test, Temporary	Aircraft on special test programs by authorized organizations or on bailment contract having a special test configuration or whose installed property has been temporarily removed to accommodate the test. At completion of the test, the vehicle will be returned either to its original configuration or to standard operational configuration.
N	Special Test, Permanent	Aircraft on special test programs by authorized activities or on bailment contract, whose configuration is so drastically changed that return of aircraft to its original configuration or conversion to standard operational configuration is beyond practicable or economical limits.
X	Experimental	Aircraft in a developmental, experimental stage where basic mission and design number have been designated but no established as a standard vehicle for service use.

LETTER	TITLE	DESCRIPTION
Y	Prototype	Aircraft procured in limited quantities to develop the potentialities of the design.
Z	Planning	Designations used for identification purpose during the planning or pre-development stage.

c. Modified missions symbols (prefix letters) are as follows:

LETTER	TITLE	DESCRIPTION
A	Attack	Aircraft modified to search out, attack, and destroy enemy land or sea targets, using conventional or special weapons. Also used for interdiction and close air support mission.
C	Cargo/ Transport	Aircraft modified for carrying cargo and/or passengers.
R	Reconnaissance	Aircraft modified and permanently equipped for photographic and/or electronic reconnaissance missions.
T	Trainer	Aircraft modified and equipped for training purposes.
U	Utility	Aircraft having small payload, modified to perform miscellaneous missions such as carrying cargo or passengers, and towing targets.
V	Staff	Aircraft modified to provide accommodations such as chairs, tables, lounge, and berths for the transportation of staff personnel.

d. Basic mission and type symbols are as follows:

LETTER	TITLE	DESCRIPTION
A	Attack	Aircraft designed to search out, attack, and destroy enemy land or sea targets, using conventional or special weapons. Also used for interdiction and close air support missions.

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LETTER	TITLE	DESCRIPTION
C	Cargo/ Transport	Aircraft designed for carrying cargo and/or passengers.
H	Helicopter	A rotary-wing aircraft designed with the capability of flight in any plan; e.g., horizontal, vertical, or diagonal.
O	Observation	Aircraft designed to observe (through visual or other means) and report tactical information concerning composition and disposition of enemy forces, troops, and supplies in an active combat area.
R	Reconnaissance	Aircraft designed to perform reconnaissance missions.
T	Trainer	Aircraft designed for training personnel in the operation of aircraft and/or related equipment, and having provisions for instructor personnel.
U	Utility	Aircraft used for miscellaneous missions such as carrying cargo and/or passengers, towing targets, etc. These aircraft include those having a small payload.
V	VTOL and STOL	Aircraft designed for vertical takeoff or landing with no takeoff or landing roll, or aircraft capable of takeoff and landing in a minimum prescribed distance.
X	Research	Aircraft designed for testing configurations of radical nature. These aircraft are not normally intended for use as tactical aircraft.

e. Application for a special aircraft designation or cancellation of a previously authorized designation may be accomplished by addressing the request to C.G. U.S. Army Materiel Command, Attn: AMCRD-F, Washington, D.C. 20315.

Section II. (FOUO) FLYING HOUR PROGRAM

The flying hour program can be calculated by taking the average inventory for the command and multiplying it by the annual flying hour program for the particular aircraft.

Example:

USCONARC	
OV-1 – Fiscal year 1972	
Average number of aircraft	13
Annual flying hour rate	240
13 X 240 = 3120 hours	

Source: OACSFOR

1-4. (FOUO) Basic Annual Flying Hour Planning Factors 1/.

a. A Worldwide Flying Hour Program is developed annually by the Department of the Army for use in budget preparation and in planning for logistical support of aircraft. It is used as a basis for management of the entire aircraft inventory and is not applicable to the operation of a single aircraft or to the aircraft of any specific aviation unit or activity.

b. The flying hour program for each major command is published annually in Annex V, Volume II of the Department of the Army Program and Budget Guidance Document. This document lists flying hour guidance in bulk flying hours for each type of aircraft assigned to the major commands. Factors considered in

development of command flying hour programs include: the projected aircraft inventory, mission requirements of the command, aviator availability, budgetary limitations, logistical considerations and other variables which may affect aircraft utilization within the commands. The DA Flying Hour Program is not expressed in flying hour rates.

c. The basic flying hour planning factors contained below are suitable for use in intermediate and long range planning at any level of command. Two points of rationale used in the development of these factors should be considered in planning applications; these are:

(1) Aircraft assigned to TOE units are intended to meet combat requirements. In a peacetime situation or non-combat environment, utilization of these aircraft should be restricted to only that flying time necessary to provide adequate training for aviation units and other units which are supported by aviation units.

(2) Indirect support aircraft are assigned to meet specific administrative and training requirements. Utilization of indirect support aircraft, except training and training support aircraft assigned to the aviation training base, must meet or exceed the planning factors shown, to justify their retention in the aircraft inventory at every level of command. Utilization of training base aircraft is determined by the student training rate approved or programmed for the year under consideration.

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1-5. (FOUO) Basic Annual Flying Hour Planning Factors ^{1/}.

TYPE AIRCRAFT	TOE PEACETIME OR NON-COMBAT ENVIRONMENT (WORLDWIDE)	TOE ACTIVE COMBAT ENVIRONMENT	INDIRECT SUPPORT AIRCRAFT (WORLDWIDE) ALL ENVIRONMENT ^{2/}
O-1		960	
U-6	300	600	600
U-8/10	384	900	600
U-21	384	900	600
OV-1	240	840	600
T-42			600
T-41			600
U-1A	360	720	600
OH-6	240	840	420
OH-13	240	660	420
OH-23	240	660	420
OH-58	240	840	420
UH-1(Armed)	240	720	420
UH-1B/C	324	720	420
UH-1D/H	324	960	420
AH-1G	240	840	
CH-34	172	600	420
CH-47	240	720	420
CH-54	180	600	

^{1/}All factors include associated float aircraft.^{2/}Does not include training and training support aircraft assigned to the training base.

Source: OACSFOR

Section III. ATTRITION

1-6. Attrition Factors, Worldwide Monthly Rates.

AIRCRAFT SYSTEMS	WORLD WIDE PEACETIME
Airplane Observation: O-1	.0018
Airplane Combat Surveillance: OV-1	.0010
Airplane Utility: U-6	.0012
Airplane Utility: U-10 ^{1/}	.0025
Airplane Fixed Wing Trainer: T-41	.0011
Airplane Instrument Trainer: T-42	.0009
Airplane Utility: U-8	.0016
Airplane Utility: U-21 ^{2/}	.0016
Airplane Utility: U-1 ^{3/}	.0021
Helicopter Instrument Trainer: TH-13	.0012
Helicopter Primary Trainer: TH-55	.0015
Helicopter Cargo Transport: CH-47	.0009
Helicopter Cargo Transport: CH-54 ^{4/}	.0009
Helicopter Observation: OH-6	.0048
Helicopter Observation: OH-13	.0021
Helicopter Observation: OH-23	.0011
Helicopter Observation: OH-58 ^{5/}	.0048
Helicopter Utility: UH-1	.0025
Helicopter Cargo Transport: CH-34	.0022
Helicopter Attack: AH-1G	.0031

World-Wide Peacetime Factors With Insufficient Or Unrealistic Experience Data:

- ^{1/} U-10. Factor of .0050 considered unrealistic. Losses during preceding 12 month period totaled 2 while only 1 loss occurred during prior 24 month period. The factor shown is based on the prior 24 month period.
- ^{2/} U-21. No peacetime loss experience. The factor shown is based on U-8.
- ^{3/} U-1. Factor of .0031 considered excessive due to high loss experience during preceding 12 month period. The factor shown is based on the prior 24 month period.
- ^{4/} CH-54. No peacetime loss experience. The factor shown is based on CH-47.
- ^{5/} OH-58. No peacetime loss experience. The factor shown is based on OH-6.

Source: AMSAV-D-ZRA

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1-7. Formula For Calculating Monthly Attrition Factors.

Maintenance Trainers, (c) Depot inventory, and (d) aircraft in-transit.

Example:

Peacetime Attrition Factor. O-1 Aircraft.

1. Time Frame = 36 months.

2. Density (average) = 455. Note: To arrive at an average in use density the following category of aircraft were deleted. (a) USARV inventory, (b)

3. Attrition during time frame = 29.

4. Calculation:

$$\frac{29 \text{ attrition}}{36 \text{ months}} \div \frac{455 \text{ density}}{36 \text{ months}} = .0018. \text{ (Monthly peacetime attrition factor)}$$

Source: AMSAV-D-ZRA

Section IV. STANDARD AIRCRAFT CHARACTERISTICS

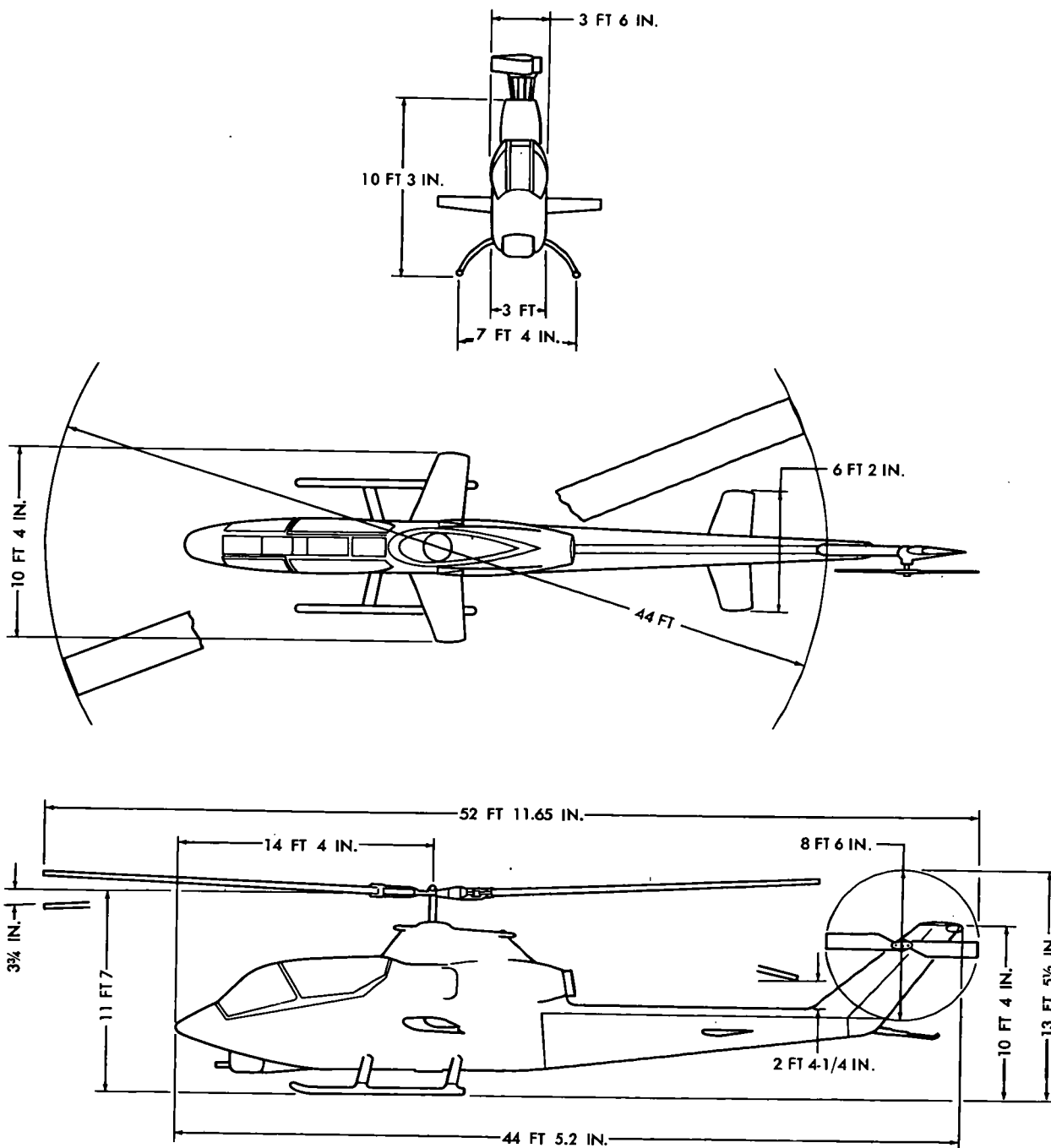
Standard aircraft characteristic data contained herein will change as modifications or additions and

deletions of aircraft components or equipment are made.



Figure 1-1. AH-1G (Hueycobra)

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Figure 1-2. Principal dimensions, AH-1G (Hueycobra)

1-8. AH-1G/TH-1G* (Hueycobra) Characteristics.

POWERPLANT						MISSION AND DESCRIPTION				WEIGHTS		
No. and Model (1) T53-L-13 Mfr .....Lycoming Engine Spec. No..... 104.33 Type Free Power Turbine Reduction Gear Ratio 0.3115 Tail Pipe .....Fixed Area Augmentation None						Mfr's Model: Bell 209 The primary missions of this aircraft are that of an armed tactical helicopter capable of delivering weapons fire, low altitude high speed flight, search and target acquisition, reconnaissance by fire, multiple weapons fire support, and troop helicopter support. The aircraft is capable of performing these missions from prepared or unprepared areas, day or night flying, and to navigate by dead reckoning or instrument operation within a wide range of temperatures, including from +125° F to below freezing conditions. The gas turbine powered "HueyCobra" is of compact design featuring tandem seating to give both pilot and gunner nearly unlimited visibility. Both crew stations have flight control and fire control systems permitting flexibility in division of functions under all normal and emergency situations. A mission designed fuselage coupled with the 540 "Door Hinge" rotor system gives a low vibration level plus increased maneuverability and speed. Four wing stores stations and an integral chin turret provide a high degree of armament versatility with the capability of quickly changing a wide combination of weapons to match the desired mission. Reliability and maintainability are ensured through the use of many UH-1 parts which have been combat proven.				LOADING LB. L.F. Empty 5425 (C) Basic 5479*(C) Design 6600 3.5 Combat Clean 6231 (C) 3.7 Light Scout 8148 (C) 2.8 Heavy Scout 7937 (C) 2.9 Hog 7020 (C) 3.3 Max. Takeoff 9500 2.4 Max. Landing 9500 (C) Calculated * For Basic Mission		
ENGINE RATINGS										FUEL AND OIL		
SEA LEVEL	NET JET									Fuel:		
STD	ESHP SHP	THRUST (LBS)	RPM	MIN	Grade JP-4/5 Spec MIL-T-5624 No. tanks 2 Location Fuselage Qty 247 gal Oil: Spec MIL-L-7808 No. tanks 1 Location Fuselage Qty 3.4 gal							
Military	1450	1400	126	6300	30							
Normal	1296	1250	115	6040	Cont.							
DIMENSIONS						DEVELOPMENT						
Rotor dia 44 ft						Date of contract 4 April 1966						
Length:						First flight (Similar aircraft) 7 September 1965						
Rotors						First acft delivered 18 September 1966						
operating 53 ft.										AVIONICS		
Rotors static 53 ft.										Refer to chapter 2.		
Fuselage 44 ft, 5-1/4 in.												
Span (max										ARMAMENT		
lateral) 10 ft, 4 in.										Refer to chapter 2.		
Height 11 ft, 7 in.												
Tread 7 ft, 4 in.												
Rotor gnd clear-												
ance (static) 7 ft, 10 in.												
						FEATURES		PERSONNEL				
						Advanced flexible gun turret. Armor protection for crew and critical components. Hardpoints for rockets, and external stores on wings. Stability Control Augmentation System (SAS) eliminates stabilizer bar and provides a stable gun platform.		Light Scout, Heavy Scout or Hog Mission Pilot .....1 Gunner .....1 Ferry Mission Pilot .....1 Copilot .....1				

*TH-1G. Addition of Instructor Flight Controls and Instrument Panel converts the AH-1G to the TH-1G.

1-9. Loading and Performance — Typical Mission AH-1G (Hueycobra).

CONDITIONS	MISSION I LIGHT SCOUT	MISSION II HEAVY SCOUT	MISSION III HOG	MISSION IV FERRY (CLEAN)
TAKEOFF WEIGHT(lb) (4)	9171	9500	9500	7671
Fuel at 6.5 lbs/gal (Grade JP-4)(lb)	1500	1205	953	1600
Payload (Outbound)(lb)	1792	2416	2668	192
Payload (inbound)(lb)	1384	1384	604	192
Takeoff Power Loading(lb SHP) (1)*	8.34	8.64	8.64	6.97
Disk Loading(lb sq ft)	6.04	6.25	6.25	5.05
Autorotation Speed (Min. R/D)(kn)	65	65	65	65
Takeoff Ground Run at SL(ft) (1)*	105	127	127	0
Takeoff to Clear 50 ft(ft) (1)*	267	344	344	0
Vertical Rate of Climb at SL(fpm) (1)*	-	-	-	1210
Maximum Rate of Climb at SL(fpm) (2)*	1330	1230	1230	1860
Speed for Max R/C at SL(kn)	64	65	65	60
Time: SL to 5000 ft(min) (2)	3.7	4.0	4.0	2.7
Time: SL to 10,000 ft(min) (2)	8.3	9.2	9.2	5.6
Service Ceiling (100 fpm)(ft) (2)	12450	11420	11420	18200
Absolute Hovering Ceiling(ft) (1)	-	-	-	10650
COMBAT RANGE(nmi) (3)	-	-	-	371.1
Average Cruise Speed(kn)	-	-	-	141
Cruising Altitude (Initial)(ft)	-	-	-	10000
Cruising Altitude (Final)(ft)	-	-	-	10000
Total Mission Time(hr)	-	-	-	2.7
COMBAT RADIUS(nmi) (3)	141.1	95.3	70.1	-
Average Cruise Speed(kn)	133	125	125	-
Cruising Altitude (Outboard) (Min/Max) .(ft)	6350/9800	5350/7250	5600/7200	-
Cruising Altitude (Inboard)(ft)	10000	10000	10000	-
Total Mission Time(hr)	2.4	1.8	1.4	-

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1-9. Loading and Performance – Typical Mission AH-1G (Hueycobra) (CONT).

CONDITIONS	MISSION I LIGHT SCOUT	MISSION II HEAVY SCOUT	MISSION III HOG	MISSION IV FERRY (CLEAN)
COMBAT WEIGHT(lb)	8148	7937	7020	6231
Combat Altitude(ft)	Sea Level	Sea Level	Sea Level	10000
Combat Speed(kn) (2)	140	137	132	155
Combat Climb(fpm) (2)	1665	1745	2140	2170
Combat Ceiling (500 ft/min)(ft) (2)	15350	16250	20200	23800
Service Ceiling (100 ft/min)(ft) (2)	16300	17100	21000	24550
Absolute Hovering Ceiling(ft) (1)	8500	9450	13750	17700
Takeoff Ground Run at SL(ft) (1)*	0	0	0	0
Takeoff to Clear 50 ft(ft) (1)*	0	0	0	0
Maximum Rate of Climb at SL(fpm) (2)*	1665	1745	2140	2490
Speed for Max R/C at SL(kn) (2)*	62	61	58	54
Max Speed at SL(kn) (2)*	140	137	132	149
Basic Speed at 5000 ft(kn) (2)*	142	139	135	154
LANDING WEIGHT(lb)	7413	7383	6578	6231
Ground Roll at SL(ft)	0	0	0	0
Total from 50 ft(ft)	0	0	0	0

NOTES

- (1) Military rated power
 - (2) Normal rated power
 - (3) Detailed description of radius and range missions are presented on paragraph 1-10
 - (4) Includes crew of two (2) at 400 pounds
 - (5) Smoke grenades and full ammo load included.
- * Based on transmission limit of 1100 shaft horsepower

PERFORMANCE BASIS

- (a) Power required is based on "Engineering Phase B Flight Test Results of the AH-1G Bell Helicopter (HueyCobra)".
- (b) Power available and fuel flow are based on Lycoming Model Spec. 104.33.
- (c) All data are for 6600 rpm.

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1-10. Performance Notes, AH-1G (Hueycobra).

LIGHT SCOUT MISSION – Armed Tactical Helicopter – Radius

Start engine; warm-up, takeoff, and climb on course at normal power to 6350 feet initial cruise altitude. Maintain 55-feet-per-minute rate of climb at cruise speed to an altitude of 9800 feet. Descend to sea level and fire rockets during a period of ten (10) minutes combat at normal power. Climb on course to 10,000 feet at normal power and return to home base at cruise speed. Range free allowances are two (2) minutes of normal power for warm-up and takeoff, ten (10) minutes of combat time at normal power, plus ten percent of initial fuel for landing and reserve.

HEAVY SCOUT MISSION – Armed Tactical Helicopter – Radius

Start engine, warm-up, takeoff, and climb on course at normal power to 5350 feet initial cruise altitude. Maintain 41.6-feet-per-minute rate of climb at cruise speed to an altitude of 7250 feet. Descend to sea level and fire rockets during a period of ten (10) minutes combat at normal power. Climb on course to 10,000 feet at normal power and return to home base at cruise speed. Range free allowances are two (2) minutes of normal power for warm-up and takeoff, ten (10) minutes of combat time at normal power, plus ten percent of initial fuel for landing and reserve.

HOG MISSION – Armed Tactical Helicopter – Radius

Start engine, warm-up, takeoff, and climb on course at normal power to 5600 feet initial cruise altitude. Maintain 50-feet-per-minute rate of climb at cruise speed to an altitude of 7200 feet. Descend to sea level

and fire rockets during a period of ten (10) minutes combat at normal power. Climb on course to 10,000 feet at normal power and return to home base at cruise speed. Range free allowances are two (2) minutes of normal power for warm-up and takeoff, ten (10) minutes of combat time at normal power, plus ten percent of initial fuel for landing and reserve.

FERRY MISSION – Clean (Without Auxiliary Tanks) – Range

Start engine, warm-up, takeoff, and climb on course at normal power to 10,000 feet initial cruise altitude. Fly out at cruise speeds until ninety percent of initial fuel is consumed and land at remote base. Range free allowance include two (2) minutes at normal rated power for warm-up and takeoff, and ten percent of initial fuel for landing and reserve.

GENERAL NOTES:

- a. Cruise speed as used above denotes airspeed for long-range operation and is the greater of the two speeds at which ninety-nine percent of the maximum miles per pound of fuel are attainable at the momentary weight and altitude.
- b. Data do not include ground effect.

PERFORMANCE BASIS:

- a. Power required is based upon "Engineering Phase B Flight-Test Data".
- b. Power available and fuel flow are based on Lycoming Model Specification No. 104.33, and includes particle separators and filters.



Figure 1-3. CH-34C (Choctaw)

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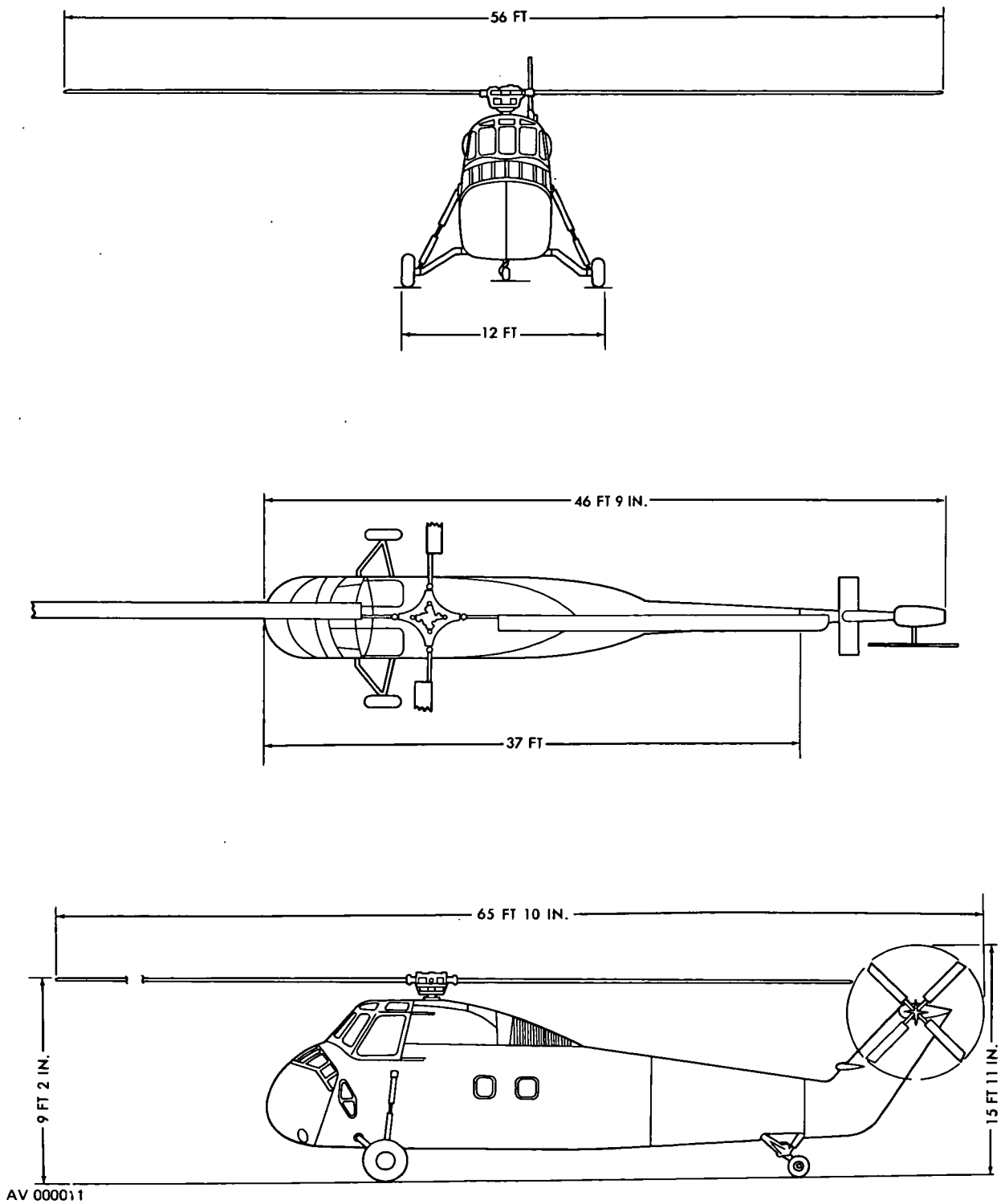


Figure 1-4. Principal dimensions, CH-34C (Choctaw)

1-11. CH-34C (Choctaw) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model ... (1) R-1820-84C Mfr Wright Engine spec No . N895D Superch 1 stg, 1 spd Red. gear ratio .. D.D.	Mfr's Model: Sikorsky S-58		LB	L.F.
ENGINE RATINGS	The principal mission of the CH-34C helicopter is the transportation of cargo and personnel (including aeromedical evacuation). The CH-34C is a single-engine helicopter using a single main lifting rotor and a single antitorque tail rotor. The main and tail rotors are four-bladed and are of all-metal construction. The engine is mounted in the nose facing aft and inclined 35 degrees from horizontal. Access to the engine compartment is provided through clam-shell type nose doors. A large cabin door facilitates rapid loading of passengers, litter patients, and cargo. A cargo sling is available for externally transporting up to 5000 pounds. Main rotor flight controls incorporate two parallel and independent hydraulic servo systems. Torque compensation by the tail rotor is automatically coordinated by engine torque to maintain a heading. For ease of starting and to lengthen rotor head life, a hydraulic clutch is used to accelerate the transmission to engine speed, at which point positive clutching occurs. Ventilation and heating are provided for the cockpit and cabin and provisions are made for winterization. The landing gear consists of a main two-wheel alighting gear and a tail wheel. The folding tail pylon reduces the stowage length to 37 feet.		Empty (calculated) ... 7,660	
			Basic 7,800	
			Design 12,068	2.63
			Combat *8,930	
BHP RPM ALT MIN Takeoff 1525 2800 700 5 Military 1425 2700 2400 30 Normal 1275 2500 3500 Cont. METO power (max except takeoff)			Max takeoff (overload) +13,300	2.44
			Max takeoff (normal) +12,068	2.63
			Max landing +13,300	2.44
			*For basic mission. +Limited by performance. (See note a paragraph 1-13.) ‡Limited by max takeoff weight.	
DIMENSIONS	DEVELOPMENT		FUEL AND OIL	
Rotor dia 56 ft Length: Rotors operating 65 ft, 10 in. Rotors static 58 ft, 3-1/2 in. Fuselage 46 ft, 9 in. Fuselage (pylon folded) 37 ft Span (max lateral) 40 ft Height 15 ft, 11 in. Tread 12 ft Main rotor gnd clearance: Idling 11 ft, 4-3/4 in. Static 9 ft, 2 in. Tail rotor gnd clearance 6 ft, 6 in.	Modified version of the Navy model XHSS-1 procured for use by the Department of Army. The XHSS-1 served as a prototype model of the CH-34C First flight (XHSS-1) March 1954 First flight December 1954 First acceptance March 1955 Production completed January 1959		Fuel: Grade 115/145 Spec MIL-G-5572 No. tanks: Fuselage, fwd .. (1) 100 gal Fuselage, cen .. (1) 70 gal Fuselage, aft .. (1) 92 gal Total qty 262 gal Oil: Grade 1100 Spec MIL-L-6082 No. tanks 2 Location Fuselage, fwd Qty 10-1/2 gal	
	CAPACITIES	PERSONNEL	AVIONICS	
	Max cargo: See "Payload-Distance", figure 1-8. Cargo compartment: Length 13 ft, 5 in. Width 5 ft Height 5 ft, 10 in. Cargo door: Height 4 ft Width 4 ft, 5 in. Height above gnd .. 2 ft, 20 in. Floor area 67-3/4 sq ft Cabin volume 405 cu ft	Crew (normal) 2 Troops 18 or Litters 8	Refer to chapter 2.	
			ARMAMENT	
			None.	

1-12. Loading and Performance - Typical Mission, CH-34C (Choctaw).

CONDITIONS	BASIC MISSION	NORMAL	DESIGN	COMBAT	EVACU- ATION	FERRY RANGE
TAKEOFF WEIGHT ^{6/} (lb) ...	13,300	12,068	12,068	12,789	9789	9789
Fuel at 6.0 lb/gal (grade 100/130) (lb) ...	1572	1572	1356	1572	1572	1572
Payload (outbound) (lb) ...	3211	2279	2506	3000	3000	None
Payload (inbound) (lb) ...	None	None	None	2000	None	None
Takeoff power loading (lb/bhp) ...	9.12	8.47	8.47	8.98	6.87	6.87
Disk loading (lb/sq ft) ...	5.29	4.91	4.91	5.20	3.98	3.98
Autorotation speed (min R/D) (kn) ...	58	58	58	58	58	58
Takeoff ground run at SL/clear 50 ft ^{1/} (ft) ...	0/0	0/0	0/0	0/0	0/0	0/0
Vertical rate of climb at SL ^{2/} (fpm) ...	100	570	570	210	1830	1830
Max rate of climb at SL ^{3/} (fpm) ...	1120	1370	1370	1200	2060	2060
Speed for max rate of climb at SL (kn) ...	65	65	65	65	65	65
Time: SL to 5000 ft ^{3/} (min) ...	4.7	3.8	3.8	4.4	2.5	2.5
Time: SL to 10,000 ft ^{3/} (min) ...	14.1	9.7	9.7	12.7	5.6	5.6
Service ceiling (100 fpm) ^{3/} (ft) ...	10,400	12,500	12,500	10,850	18,200	18,200
Absolute hovering ceiling ^{2/} (ft) ...	2100	4800	4800	3000	11,200	11,200
COMBAT RANGE ^{4/} (nmi) ...	238	290	251	245	....	371
Average cruising speed (kn) ...	94	85	90	95	....	98
Cruising altitude (ft) ...	5000	5000	SL	5000	....	5000
Total mission time (hr) ...	2.6	3.4	2.8	2.6	....	3.8
COMBAT RADIUS ^{4/} (nmi) ...	131	148	116	123	154	....
Average cruising speed (kn) ...	98	91	93	92	93	....
Cruising altitude (ft) ...	5000	5000	SL	5000	5000	....
Total mission time (hr) ...	2.7	3.3	2.5	2.7	2.7	3.4
FIRST LANDING WEIGHT ^{5/} (lb) ...	12,141	11,269	11,360	11,989	9123	....
Ground roll at SL/clear 50 ft (ft) ...	0/0	0/0	0/0	0/0	0/0	0/0
COMBAT WEIGHT ^{5/} (lb) ...	8930	8990	8854	10,989	11,123	8375
Combat altitude (ft) ...	5000	5000	SL	5000	5000	5000
Combat speed ^{3/} (kn) ...	136 ^{7/}	136 ^{7/}	133	126	125	137
Combat climb ^{2/} (fpm) ...	2330	2300	2580	1600	1560	2550
Combat ceiling (500 fpm) ^{2/} (ft) ...	19,500	19,350	19,700	14,400	14,100	20,900
Service ceiling (100 fpm) ^{3/} (ft) ...	20,500	20,350	20,700	15,200	14,700	22,000
Absolute hovering ceiling ^{2/} (ft) ...	13,700	13,600	14,000	7800	7400	15,500
Takeoff ground run at SL/clear 50 ft ^{1/} (ft) ...	0/0	0/0	0/0	0/0	0/0	0/0
Max rate of climb at SL ^{2/} (fpm) ...	2540	2520	2580	1860	1820	2790
Speed for max rate of climb at SL ^{3/} (kn) ...	65	65	65	65	65	65
Max speed at SL ^{3/} (kn) ...	133	132	133	128	127	134
Basic speed at 5000 ft ^{3/} (ft) ...	136	136	136	126	125	137

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1-12. Loading and Performance - Typical Mission, CH-34C (Choctaw) (CONT).

CONDITIONS	BASIC MISSION	NORMAL	DESIGN	COMBAT	EVACU- ATION	FERRY RANGE
LANDING WEIGHT ^{5/} (lb) ...	8375	8375	8342	10,375	10,375	8375
Ground roll at SL/clear 50 ft (ft) ...	0/0	0/0	0/0	0/0	0/0	0/0

^{1/}Max power.

^{2/}Military power.

^{3/}METO (max except takeoff).

^{4/}Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-13.

^{5/}For RADIUS mission if radius is shown.

^{6/}Includes crew of 2 at 400 lb.

^{7/}Limited by Mach 0.8 at $\approx 90^\circ$.

Performance Basis:

- Data source: Phase IV flight tests.
- Performance is based on powers shown.
- Data do not include ground effect except for takeoff and landing.

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1-13. Performance Notes, CH-34C (Choctaw).

FORMULA: RADIUS MISSIONS I & II

Warm up, take off, climb on course to 5000 feet at METO power, cruise out at long range speeds to an advanced area, land, and unload cargo. Without refueling, warm up, take off, climb on course to 5000 feet at METO power, and return at long range speeds. Range-free allowances are 10 minutes of METO power for warmups and takeoffs, plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Same as Radius Missions I & II, except at sea level.

FORMULA: RADIUS MISSION IV

Same as Radius Missions I & II, except eight litter patients are carried on inbound leg.

FORMULA: RADIUS MISSION V

Same as Radius Missions I & II, except payload is carried inbound instead of outbound.

FORMULA: RANGE MISSIONS I, II, IV & VI

Warm up, take off, climb on course to 5000 feet at METO power, and cruise out at long range speeds until only reserve fuel remains. Range-free allowances are 5 minutes of METO power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Same as Range Missions I, II, IV & VI, except at sea level.

GENERAL DATA

a. Maximum overload takeoff weight is limited by the requirement that vertical climb at sea level on a standard day with military power shall not be less than 100 fpm. Maximum normal takeoff weight is limited by the requirement that vertical climb at sea level on a hot day with military power shall not be less than 300 fpm.

b. Engine ratings shown are engine manufacturer's guaranteed ratings. Power values used in performance calculations for the R-1820-84C engine are as follows:

	BHP	RPM	CRITICAL ALTITUDE
Max	1425	2800	2450
Military	1400	2700	2550
METO	1275	2500	3100

PERFORMANCE REFERENCE

Sikorsky Aircraft Report No. 58123, Substantiating Data for Standard Aircraft Characteristics and Performances Charts for H-34A Helicopter.

DATA SOURCE

Sikorsky Aircraft Report No. SER 3236, Detail Specification.

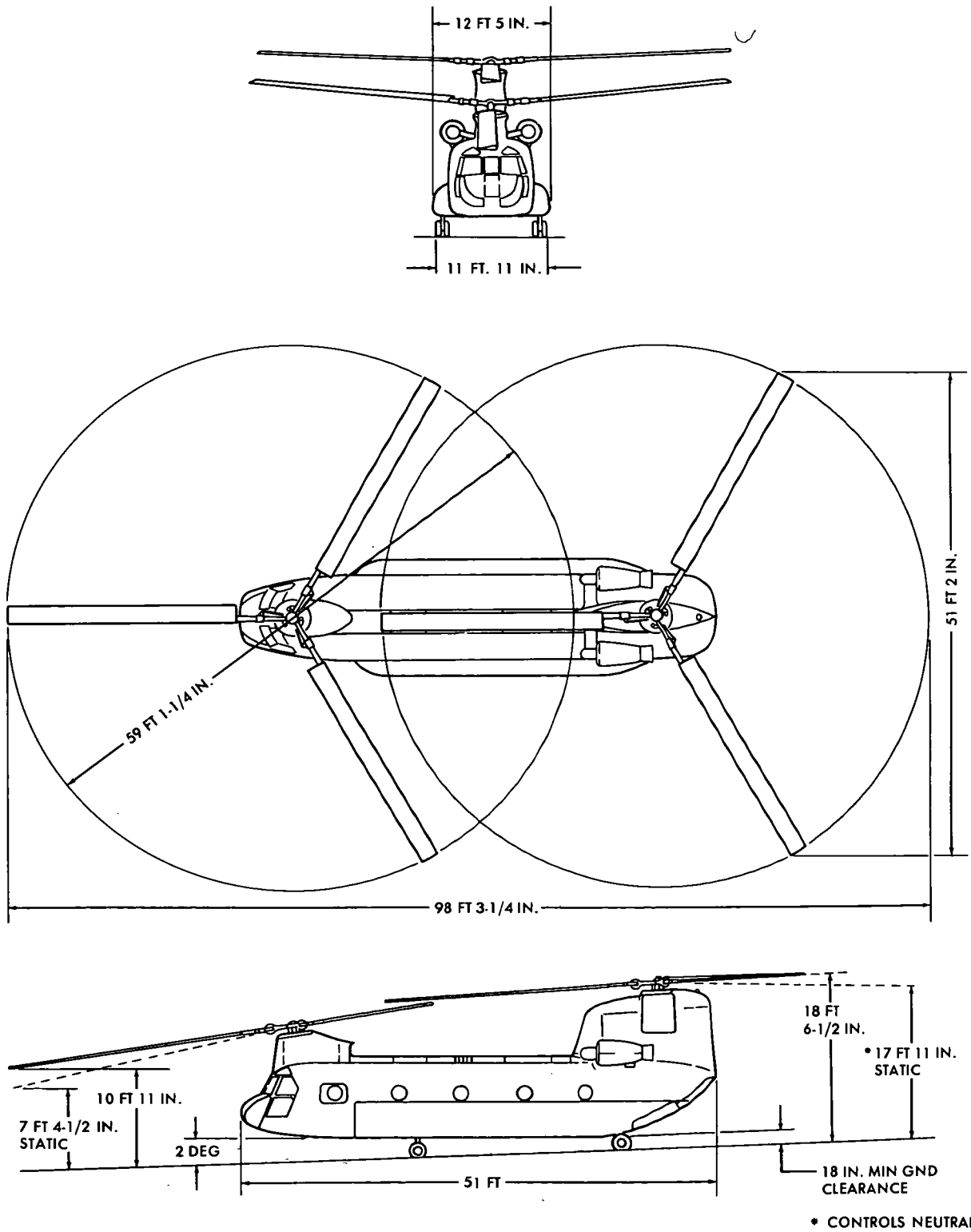
Wright Aero Div. Engine Spec. No. N-895D.



AV 000016

Figure 1-5. CH-47A, B, and C (Chinook), typical (minor differences apparent between A, B, and C models)

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Figure 1-6. Principal dimensions, CH47A (Chinook)

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1-14. CH-47A (Chinook) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) T55-L-7 Mfr Lycoming Engine spec No . . . T55-L-5 124.18C T55-L-7/7B 124.20-A T55-L-7C 124.31	Mfr's Model: Vertol The principal mission of the CH-47A helicopter is the transport of cargo, troops, and equipment within the combat area. In addition, this helicopter is suitable for special support functions. It is suitable for operations during day, night, visual, and instrument conditions. The CH-47A helicopter is a twin-turbine-engine, tandem rotary-wing aircraft. It is powered by two Lycoming T55-L-7 shaft turbine engines mounted on the aft fuselage. The engines simultaneously drive two tandem three-bladed rotary wings through a combining transmission, drive shafting, and reduction transmission. The forward transmission is mounted in the pylon above the cockpit. The aft transmission, the combining transmission, and drive shafting are located in the aft pylon section. A gas-turbined auxiliary power unit, used for starting the engines, is mounted in the aft pylon section. Pods on the sides of the fuselage contain fuel tanks. The helicopter is equipped with nonretractable quadricycle landing gear. The aft wheels are full-swivel type. The entrance door is located at the forward right side of the cabin fuselage section. At the rear of the cabin fuselage section is a hydraulically powered loading ramp. A 16,000 pound cargo hook assembly is provided for transporting external loads.		LB	L.F.
ENGINE RATINGS			FUEL AND OIL	
SHP RPM ALT MIN			Fuel: Grade JP-4 Spec MIL-T-5624 No. tanks: Nacelle (2) 621 gal (50 percent self-sealing) 630 gal (non-self-sealing)	
T55-L-7 Military 2650 15,150 SL 30 Normal 2200 15,000 SL Cont.			Oil: Spec Temps above -25°F MIL-L-23699 Temps below -25°F MIL-L-7808 No. tanks 2 Location Integral with engine Qty 7 gal	
T55-L-7B Military 2650 15,800 SL 30 Normal 2200 15,000 SL Cont.				
T55-L-7C Max 2850 16,000 SL 10 Military 2650 15,750 SL 30 Normal 2500 15,350 SL Cont.				
DIMENSIONS		DEVELOPMENT		
Rotor dia 59 ft, 1-1/4 in. Length: Rotors operating . . 98 ft, 3-1/4 in. Rotors folded . 51 ft Fuselage . . . 51 ft Height 18 ft, 6-1/2 in. Tread 11 ft, 6 in. Main rotor gnd clearance: Idling (fwd) . . 10 ft, 11 in. (aft) . . . 18 ft, 6-1/2 in. Static (fwd) . . 7 ft, 8 in. (aft) . . . 17 ft, 11 in.		Date of contract 27 June 1960 First flight 6 September 1961 Production status Completed May 1967		
		CAPACITIES	PERSONNEL	
		Cargo compartment: Floor 226-1/4 Length 30 ft, 2 in. Width 7 ft, 6 in. Height 6 ft, 6 in. Volume 1487 cu ft Forward door: Height 5 ft, 6 in. Width 3 ft Cargo ramp door: Length 6 ft, 6 in. Width 7 ft, 6 in.	Crew (normal) 4 Troops 33 Litters 24	
		AVIONICS		
		Refer to chapter 2.		
		ARMAMENT		
		Refer to chapter 2.		

1-15. Loading and Performance - Typical Mission, CH-47A (Chinook).

CONDITIONS	MISSION	MISSION	MISSION
	I	II	III
Gross weight (lb) . . .	28,262	33,000	33,000
Weight empty (lb) . . .	17,932	18,112	17,552
Payload (lb) . . .	6000	13,400	---
Radius of action (nmi) . . .	100	20	---
Ferry range (nmi) . . .	---	---	866
Cruise altitude (ft) . . .	SL	SL	6000
Cruise speed (kn) . . .	130	110	110
V _{Max} @ SL military power (kn) . . .	130	110	110
V _{Max} @ SL normal power (kn) . . .	130	110	110
V _{Max} @ 5000 ft, normal power (kn) . . .	114	94	94
Hover ceiling OGE 95°F, military power, std atmosphere (ft) . . .	6000	7900	7900
Hover ceiling IGE military power, std atmosphere . . (ft) . . .	11,900	9200	9200
Service ceiling			
Normal power (ft) . . .	11,900	9200	9200
Military power 1 eng out (ft) . . .	6000	1400	1400
R/C Max — military power — SL (ft/min) . . .	2750	2160	2166

- NOTES: 1. All performance based on NASA standard atmosphere unless otherwise noted.
2. V_{Max} reflects airspeed limitations specified in TM55-1520-209-10.
3. CH-47A model specifications 114-X-601.

1-16. Performance Notes, CH-47A (Chinook).**FORMULA: MISSION I**

Deliver 6000-pound internal payload to any point 100 nautical miles and return with 3000-pound internal payload. Cruise at sea level. Land with 10 percent of initial fuel reserve.

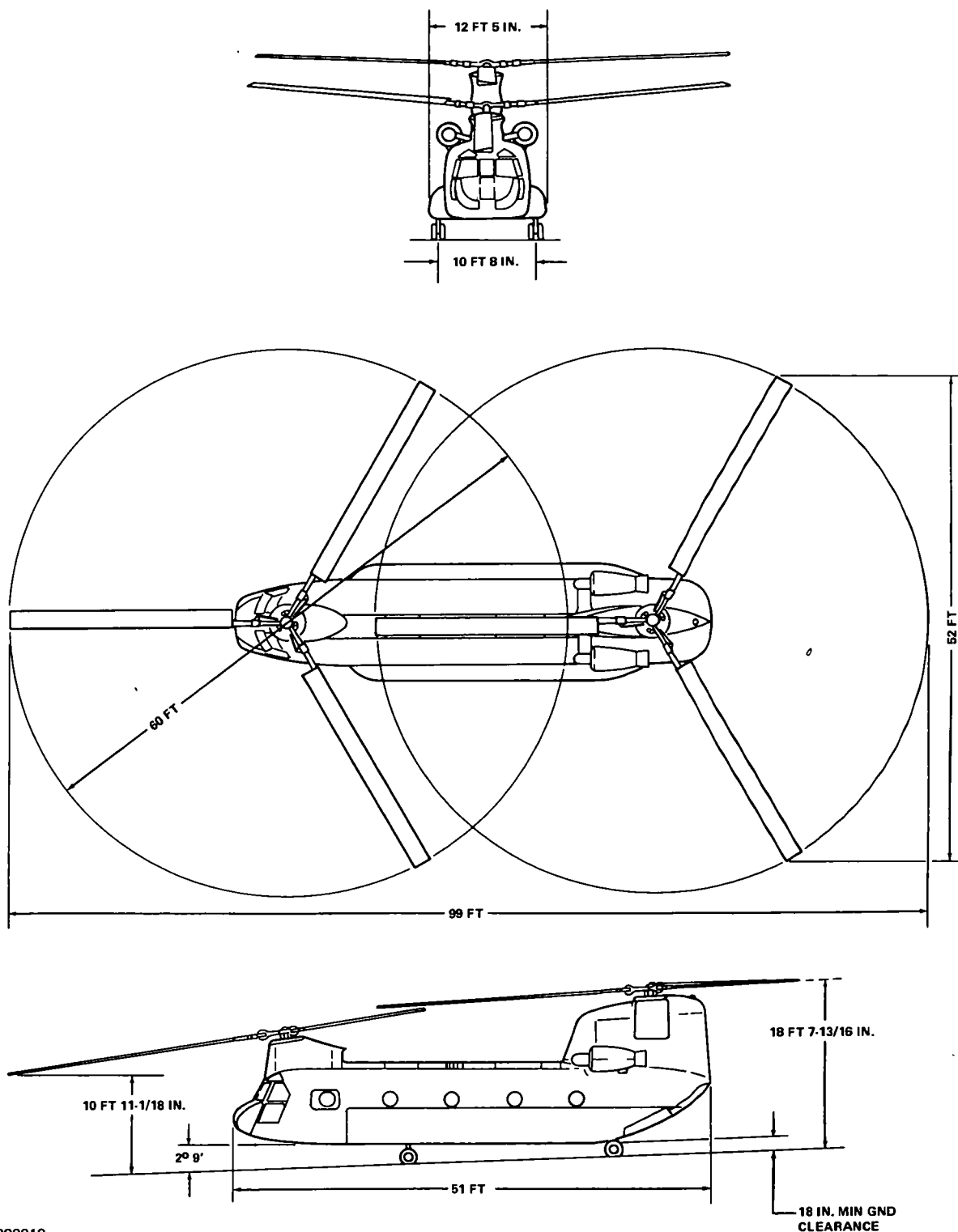
FORMULA: MISSION II

Deliver 13,400-pound external payload to any point 20 nautical miles and return. Equivalent flat

plate of external cargo = 26 sq ft. Cruise at sea level. Return with fuel reserve for 10-minute cruise at return gross weight.

FORMULA: MISSION III

Ferry Range of 866 nautical miles. Land with 10 percent of initial fuel reserve. Climb to 6000 feet, 256 nautical miles. Cruise 6000 feet for 610 nautical miles. Total ferry time: 7 hours, 50 minutes.



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Figure 1-7. Principal dimensions, Ch-47B and C (Chinook)

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1-17. CH-47B (Chinook) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) T55-L-7C Mfr Lycoming Engine spec No. T55-L-7B 124.20-A T55-L-7C 124.31 Engine/rotor gear ratio 65.93:1	Mfr's Model: Vertol The principal mission of the CH-47B helicopter is to provide air transportation for troops and cargo. The aircraft can also be utilized for rescue of personnel. The CH-47B is a large tandem rotor helicopter with built-in accommodations for 24 litter patients and 2 attendants or 33 troops and troop commander. The helicopter is equipped with an unobstructed 30-foot long cargo compartment with straight-in rear loading and has a capacity of over 2450 cubic feet. Other features include an external cargo hook of 10-ton capacity which may be used for towing operations; an auxiliary power unit which powers the utility hydraulic system, thus eliminating the requirement for external ground power sources; stability system provided through Vertol SAS; and provisions for utilizing collapsible fuel tanks to increase the fuel capacity by 2000 gallons. The complete helicopter is designed for operations in temperatures ranging from -25° F. to +125° F.		LB	L.F.
ENGINE RATINGS			Empty	*19,153
			Basic	*19,194
			Design	33,000 3.00
			Combat	*21,734 3.00
			Max alternate gross weight . . .	40,000 2.54
			Normal takeoff . .	33,000 3.00
			Alternate takeoff .	40,000 2.54
			Max landing	40,000 2.54
			*For basic mission.	
			FUEL AND OIL	
			Fuel:	
			Grade JP-4	
			Spec MIL-T-5624	
			No. tanks:	
			Fuselage (2) 621 gal	
			Oil:	
			Engine contained oil supply	
			Spec	
			Temps above 25° F. MIL-L-23699	
			Temps below 25° F. MIL-L-7808	
			Qty 7 gal	
			AVIONICS	
			Refer to chapter 2.	
			ARMAMENT	
			Refer to chapter 2.	
DIMENSIONS	DEVELOPMENT			
Rotor dia 60 ft	Date of contract June 1966			
Length:	First flight October 1966			
Rotors	Production status Completed February 1968			
operating . . . 98 ft, 11 in.				
Rotors folded . 51 ft				
Fuselage 51 ft				
Height (overall) . 18 ft, 7-3/4 in.				
Tread 10 ft, 6 in.				
Rotor ground clearance:				
Static fwd 7 ft, 2-1/2 in.				
Idling fwd 10 ft, 11 in.				
	CAPACITIES	PERSONNEL		
	Cargo compartment:	Crew 4		
	Floor 226-1/2 sq ft	Litters 24		
	Width 7 ft, 6 in.			
	Height 6 ft, 6 in.	or		
	Length 30 ft, 2-1/2 in.	Troops 33		
	Cargo ramp door:			
	Length 6 ft, 6 in.			
	Width 7 ft, 6 in.			
	Entrance door:			
	Height 5 ft, 2-1/2 in.			
	Width 2 ft, 10-3/4 in.			
	Height above ground			
	⌒ door . . . 3 ft, 6 in.			

1-18. Loading and Performance - Typical Mission, CH-47B (Chinook)

CONDITIONS	BASIC MISSION ^{4/} I	BASIC MISSION ^{5/} (DESIGN GW) II	PRIMARY MISSION ^{6/} III	EXTERNAL PAYLOAD MISSION ^{9/} IV	MAXIMUM FERRY MISSION ^{10/} V
Estimated gross weight (lb)...	30,900	33,000	40,000	40,000	40,000
Payload guaranteed (outbound) (lb)...	6,000	-	-	-	-
Payload guaranteed (inbound) (lb)...	3,000	-	-	-	-
Payload estimated (outbound) (lb)...	7,000	9,000	15,900	18,800	1,075
Payload estimated (inbound) (lb)...	3,500	4,500	7,935	0	-
V _{max} at SL/STD, military power (kn)...	168 ^{2/}	165 ^{2/}	145 ^{2/}	138 ^{1/2/}	145 ^{2/}
Max cruise speed at SL/STD, normal power,					
Guaranteed (kn)...		150	-	-	-
Estimated (kn)...	166	163	142	132 ^{1/}	142
V-Cruise (best range) at SL/STD (kn)...	145	144	134	100 ^{3/}	134
V-Cruise (best range) at 5000 F (kn)...	138	134	114	100	114
Max rate-of-climb at SL/STD military power (ft/min)...	2,440 ^{2/}	2,200 ^{2/}	1,520 ^{2/}	1,440	1,520
Vertical rate-of-climb at SL/STD, maximum power (ft/min)...	2,300 ^{2/}	1,800 ^{2/}	60	60	60
Service ceiling at normal power (ft)...	18,000	16,200	9,550	8,950	9,550
Service ceiling, single engine at military power					
Guaranteed (ft)...	6,000	-	-	-	-
Estimated (ft)...	6,050	3,650	-	-	-
Hover ceiling, OGE at STD temperature maximum power (ft)...	12,850	10,650	700 ^{2/}	700 ^{2/}	700 ^{2/}
Hover ceiling, IGE at STD temperature maximum power, 10 ft wheel height (ft)...	16,300	14,200	7,400	7,400	7,400
Radius of action					
Guaranteed (nmi)...	100	-	-	-	-
Estimated (nmi)...	100	100	95	20	-
Ferry range (nmi)...	-	-	-	-	1,090

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1-18. Loading and Performance - Typical Mission, CH-47B (Chinook) (CONT).

NOTES:

¹/With external payload equivalent to 26 ft. ²/drag area.

²/Transmission limit.

³/Mission cruise speed.

The above table reflects performance capability only. For approved operational limits which consider all pertinent factors, see TM 55-1520-209-10.

For Mission I the helicopter shall be capable of hovering at 6000 ft. for ten minutes at 95°F, OGE at the gross weight required for the accomplishment of Mission I (guaranteed). The Mission I gross weight includes an outbound payload of 6000 lb., return payload of 3000 lb., and fuel for a radius of 100 nmi.

During Mission III the helicopter shall be capable of hovering out-of-ground effect at sea level standard, maximum power and at a gross weight of 39,500 pounds (guaranteed).

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1-19. Performance Notes, CH-47B (Chinook).**FORMULA: RADIUS MISSIONS I & II**

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds to remote base, land, and unload cargo. Without refueling, warm up, take off, climb on course to 5000 feet at normal power, and return at long range speeds. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, cruise out at long range speeds at sea level to remote base, land, and unload outbound cargo, load inbound cargo. Without refueling, warm up, take off, return at long range speeds at sea level, land, and unload cargo. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION IV

Warm up, take off, cruise out at 100 knots at sea level with external cargo to remote base, detach cargo, and land. Without refueling, warm up, take off, and return at long range speeds at sea level. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 minutes of cruise fuel for reserve.

FORMULA: RANGE MISSIONS I & II

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds until 90 percent of initial fuel is consumed, land, and unload cargo. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, cruise out at long range speeds at sea level until 90 percent of initial fuel is consumed, land, and unload cargo. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION IV

Warm up, take off, cruise out at 100 knots at sea level with external cargo until 10 minutes of cruise fuel remains, detach cargo, and land. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 minutes of cruise fuel for reserve.

FORMULA: RANGE MISSION V

Warm up, take off, climb on course to optimum cruise altitude at cruise speed, cruise out at long range speeds until 90 percent of initial fuel is consumed. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

PERFORMANCE REFERENCES

Vertol Report 114-P-J-602. Detail Specifications for The Model CH-47B Helicopter.

Boeing-Vertol Report 114-AD-601. Estimated Performance Capability of CH-47B and CH-47C Helicopters.

Lycoming Model Specification 124.31, T55-L-7C Shaft Turbine Engine.

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1-20. CH-47C (Chinook) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) T55-L-11 Mfr Lycoming Engine spec No .. 124.27A Engine/Rotor gear ratio 64.05:1	Mfr's Model: Vertol The principal mission of the CH-47C is to provide air transportation for troops and cargo. The aircraft can also be utilized for rescue of personnel. The CH-47C is a large tandem rotor helicopter with built-in accommodations for 24 litter patients and 2 attendants or 33 troops and troop commander. The helicopter is equipped with an unobstructed 30-foot long cargo compartment with straight-in rear loading and has a capacity of over 1450 cubic feet. Other features include an external cargo hook of 10-ton capacity which may be used for towing operations; an auxiliary power unit which powers the utility hydraulic system, thus eliminating the requirements for external ground power sources; stability system provided through Vertol SAS; and provisions for utilizing collapsible fuel tanks to increase the fuel capacity by 2000 gallons. The complete helicopter is designed for operations in temperatures ranging from -25°F to +125°F.		LB	L.F.
ENGINE RATINGS			Empty	\$19,723
SHP RPM ALT MIN			Basic	\$19,772
Max ... 3750 16000 SL 10			Design	33,000 3.00
Mil ... 3400 16000 SL 30			Combat	\$23,886 3.00
Nor ... 3000 15400 SL Cont.			Max alternate gross wt	46,000
DIMENSIONS	DEVELOPMENT		Normal takeoff	33,000
Rotor dia 60 ft			Alternate takeoff	46,000
Length:	Date of contract June 1966		Max landing	46,000
Rotors			FUEL AND OIL	
operating ... 99 ft	Aircraft in production January 1969		Fuel:	
Rotors folded . 51 ft			Grade	JP-4
Fuselage 51 ft	CLEARANCES		Spec	MIL-T-5624
Height (overall) . 18 ft, 7-3/4 in.			No. tanks:	
Tread 10 ft, 6 in.	PERSONNEL		Fuselage main.. (2) 621 gal	
Rotor ground clearance			Fuselage aux... (4) 520 gal	
Static fwd 7 ft, 2-1/2 in.	Cargo Compartment:		Qty	1141 gal
Idling fwd 10 ft, 11 in.			Oil:	
	Crew 4		Engine contained oil supply	
			Spec	
	Troops 33		Temps above	
			25° F	MIL-L-23699
	or		Temps below	
			25° F	MIL-L-7808
	Litters 24		Qty	7 gal
			AVIONICS	
	Cargo Ramp Door:		Refer to chapter 2.	
			ARMAMENT	
	Entrance Door:		Refer to chapter 2.	
	Height 5 ft, 2-1/2 in.			
	Width 2 ft, 10-3/4 in.			
	Height above ground			
	at $\bar{C}_L$ door 3 ft, 6 in.			

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1-21. Loading and Performance — Typical Mission, CH-47C (Chinook).

CONDITIONS	BASIC MISSION I	BASIC MISSION (DESIGN GW) II	PRIMARY MISSION III	EXTERNAL PAYLOAD MISSION IV ^{1/}	MAXIMUM FERRY MISSION V
Gross weight (lb)	39,200 ^{2/}	33,000	46,000	46,000	46,000
Payload guaranteed (outbound) (lb)	12,000	-	-	-	-
Payload guaranteed (inbound) (lb)	6,000	-	-	-	-
Payload estimated (outbound) (lb)	13,300	7,350	19,750	23,300	-
Payload estimated (inbound) (lb)	6,650	3,675	9,875	0	-
V _{max} at SL/STD, military power (kn)	156 ^{4/}	164 ^{3/}	123 ^{4/}	100 ^{3/}	123 ^{4/}
Max cruise speed at SL/STD normal power					
Guaranteed (kn)	-	155	-	-	-
Estimated (kn)	156 ^{4/}	164 ^{3/}	123 ^{4/}	100 ^{3/}	123 ^{4/}
V-Cruise (best range) at SL/STD (kn)	141	140	123 ^{4/}	100 ^{3/}	123 ^{4/}
V-Cruise (best range) at 5000 ft/STD (kn)	136	138	111 ^{4/}	100 ^{3/}	111 ^{4/}
Rate-of-climb at SL/STD military power (ft/min)	2,045 ^{3/}	2,880 ^{3/}	1,380 ^{3/}	1,260 ^{3/}	1,380 ^{3/}
Vertical rate-of-climb at SL/STD maximum power (ft/min)	1,220 ^{3/}	2,585 ^{3/}	-	-	-
Service ceiling at normal power (ft)	10,200 ^{4/}	15,000 ^{3/}	8,000 ^{4/}	8,000 ^{4/}	8,000 ^{4/}
Service ceiling, STD temp, single engine at military power					
Guaranteed (ft)	4,000	-	-	-	-
Estimated (ft)	4,500 ^{2/ 3/}	9,550 ^{2/}	-	-	-
Hover ceiling, OGE at STD temperature, max power (ft)	9,600	14,750	-	-	-
Hover ceiling IGE at STD temperature, maximum power, 10 ft. wheel height	12,750	15,000	7,600	7,600	7,600
Radius of action,					
Guaranteed (nmi)	100	-	-	-	-
Estimated (nmi)	100	100	100	20	-
Ferry range (nmi)	-	-	-	-	1,226

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1-21. Loading and Performance – Typical Mission, CH-47C (Chinook) (CONT).

NOTES:

- 1/ With External Payload Equivalent to 26 FT² Drag Area (Troop Seats Incl.)
- 2/ Hover Gross Weight at 6000 ft/95°F at 245 RPM.
- 3/ Transmission Limit
- 4/ Structural Envelope
- 5/ Mission Cruise Speed (Outbound)
- 6/ Current Hydraulic System Limit
- 7/ At 230 RPM
- 8/ With 12000 LB Payload

For Mission I the helicopter shall be capable of hovering at 6000 ft for 10 minutes at 95°F, OGE at gross weight required for accomplishment of Mission I (guaranteed). The Mission I gross weight includes an outbound payload of 12,000 lb., return payload of 6000 lb., and fuel for a radius of 100 nmi.

During Mission III the helicopter shall be capable of hovering out-of-ground effect at SL/STD, maximum power, and a gross weight of 43,000 pounds (guaranteed).

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1-22. Performance Notes, CH-47C (Chinook).**FORMULA: RADIUS MISSIONS I & II**

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds to remote base, land, and unload cargo. Without refueling, warm up, take off, climb on course to 5000 feet at normal power, and return at long range speeds. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, cruise out at long range speeds at sea level to remote base, land, and unload outbound cargo, load inbound cargo. Without refueling, warm up, take off, return at long range speeds at sea level, land and unload cargo. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION IV

Warm up, take off, cruise out at 100 knots at sea level with external cargo to remote base, detach cargo, and land. Without refueling, warm up, take off, and return at long range speeds at sea level. Range-free allowances are 2 minutes of normal power for each warmup and takeoff, plus 10 minutes of cruise fuel for reserve.

FORMULA: RANGE MISSIONS I & II

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds until 90 percent of initial fuel is consumed, land, and

unload cargo. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, cruise out at long range speeds at sea level until 90 percent of initial fuel is consumed, land, and unload cargo. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION IV

Warm up, take off, cruise out at 100 knots at sea level with external cargo until 10 minutes of cruise fuel remains, detach cargo, and land. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 minutes of cruise fuel for reserve.

FORMULA: RANGE MISSION V

Warm up, take off, climb on course to optimum cruise altitude at cruise speed, and cruise out at long range speeds until 90 percent of initial fuel is consumed. Range-free allowances are 2 minutes of normal power for warmup and takeoff, plus 10 percent of initial fuel for reserve.

PERFORMANCE REFERENCES

Vertol Report 114-PJ-7003, Detail Specification for The CH-47C Helicopter.

Lycoming Report 124.27, T55-L-11 Engine Specification.

Boeing-Vertol Report 114-AD-601, Estimated Performance Capabilities of CH-47B and CH-47C Helicopters.

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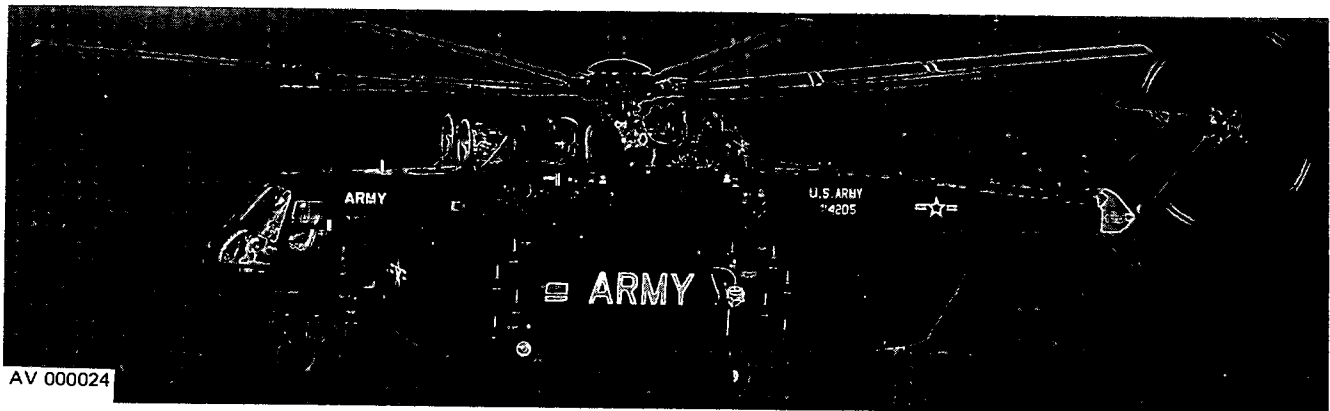
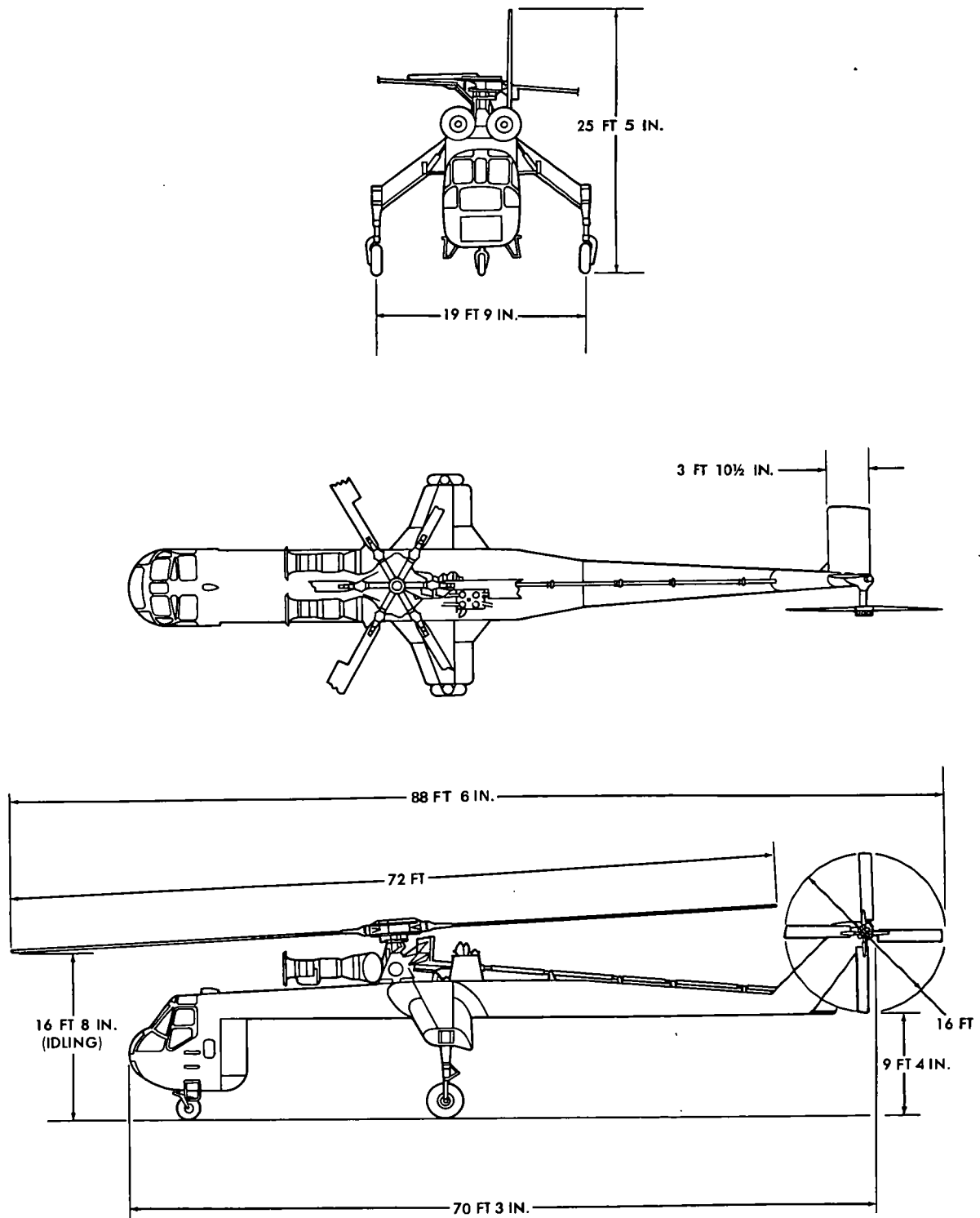


Figure 1-8. CH-54A and B (Tarhe), typical (minor differences apparent between A and B models)



AV 000025

Figure 1-9. Principal dimensions, CH-54A and B (Tarhe)

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1-23. CH-54A (Tarhe) Characteristics.

POWERPLANT				MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) JFTD12A-1 or (2) T73-P-1 Mfr Pratt & Whitney Spec 2424 Type Axial Weight 925 lb				Mfr's Model: Sikorsky Missions that may be accomplished with the CH-54A helicopter include: movement of heavy outsized loads, towing of surface vehicles, recovery of downed aircraft, and by use of detachable pods, transportation of personnel, vehicles, and equipment. Since cargo is carried externally by a hoist, the ground crew may load or unload cargo while the helicopter hovers overhead, thereby extending the operational capability into areas unsuitable for landing. Flattopped fuselage serves as a work platform for servicing engines, rotor systems, and main components. This helicopter is of the all-metal, single main rotor type with one anti-torque tail rotor. The two gas turbine engines are located above the fuselage. The wheel-type alighting gear consists of two fixed main gear assemblies and a fixed nose gear assembly. The enclosed cockpit forming the nose of the helicopter carries basic accommodations for pilot, copilot, and an aft facing pilot. Conventional helicopter flight controls are provided for forward facing pilot seats. Automatic stabilization equipment is also provided. The aft facing pilot seat has cyclic and directional trim controls and a conventional collective pitch stick. Cargo handling provisions include a hydraulic powered hoist. Space and structural provisions are also made for a cargo sling or towing assembly.		LB L.F. Empty 19,234 Basic 20,650 Gross (design) 38,000 2.50 Alternate takeoff gross . . *42,000 2.26 **Combat 22,024 *Limited by performance. **Basic mission.	
ENGINE RATINGS						FUEL AND OIL	
JFTD12A-1 SHP RPM MIN Military . . . 4050 9000 30 Normal rated 3200 9000 Cont. T73-P-1 SHP RPM MIN Military . . . 4500 9000 30 Normal rated 4000 9000 Cont.				DEVELOPMENT First production acft delivered Nov 66 Production status out of production		Fuel: Grade JP-1, -4, or -5 Spec MIL-T-5624 Qty 1338 gal Oil: Spec MIL-L-23699 Qty 1.9 gal	
DIMENSIONS						AVIONICS	
Main rotor dia 72 ft Length (rotors operating) 88 ft, 5 in. Length (fuselage) 70 ft, 3 in. Height (static) 25 ft, 5 in. Width (cockpit) 7 ft, 1 in. Tread 19 ft, 9 in. Gnd clearance: Main rotor (idling) . . 16 ft, 8 in. Tail rotor 9 ft, 4 in.				None.		Refer to chapter 2.	
						ARMAMENT	
				FEATURES		PERSONNEL	
				Six-blade main rotor. Rear facing seat for aft pilot/hoist operator. A four-point 20,000 lb capacity cargo hoist suspension system and a 15,000 lb capacity hoist. Four-blade, anti-torque tail rotor.		Crew (normal) 3 Pilot 1 Copilot 1 Aft pilot 1 Passengers (with Pod Attached) Troops 45 or Litters 24 and Attendants 3	

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1-24. Loading and Performance - Typical Mission, CH-54A (Tarhe).

CONDITIONS	BASIC MISSION I	100 MILE RADIUS II	ALTERNATE CARGO III	FERRY RANGE IV	
TAKEOFF WEIGHT ^{4/}	(lb)...	38,000	26,878	42,000	26,478
Fuel	(lb)...	8,700	8,700	1,950	8,700
Payload (outbound)	(lb)...	11,522 ^{5/}	None	20,000 ^{5/}	None
Payload (inbound)	(lb)...	None	16,000 ^{6/}	None	None
Takeoff power loading	(lb/bhp)...	7.04	4.98	6.37	4.91
Disk loading	(lb/sq ft)...	9.33	6.60	10.32	6.50
Vertical rate of climb at SL ^{1/}	(fpm)...	1,400		400	
Max rate of climb at SL ^{1/}	(fpm)...	1,714	3,000	1,320	3,050
Max rate of climb (one engine out) ^{1/}	(fpm)...	773	1,700	400	1,750
Service ceiling (100 fpm) ^{1/}	(ft)...	12,100	19,600	6,000	19,900
Service ceiling (one engine out) ^{1/}	(ft)...	6,800	13,300	2,300	13,600
Absolute hovering ceiling ^{1/}	(ft)...		18,100	6,000	18,400
COMBAT RANGE ^{3/}	(nmi)...	234	259	42	274
Average cruising speed	(kn)...	95	85	95	95
Cruising altitude	(ft)...	SL	SL	SL	SL
Total mission time	(hrs)...	2.5	3.05	0.57	2.9
COMBAT RADIUS ^{3/}	(nmi)...	124	100	25	—
Average cruising speed	(kn)...	95	85	95	—
Cruising altitude	(ft)...	SL	SL	SL	—
Total mission time	(hrs)...	2.6	2.4	0.53	—
FIRST LANDING WEIGHT	(lb)...	33,688	— ^{7/}	—	—
COMBAT WEIGHT	(lb)...	22,024	39,421		18,648
Combat altitude	(ft)...	SL	SL		SL
Combat speed ^{2/}	(kn)...	130 ^{8/}	90		130 ^{8/}
Combat climb ^{1/}	(fpm)...	3,800	1,340		4,150
Combat ceiling ^{1/}	(ft)...	22,100	6,600		24,600
Service ceiling ^{1/}	(ft)...	23,200	8,900		25,600
Absolute hovering ceiling ^{1/}	(ft)...	21,900	4,000		24,400
Max rate of climb at SL ^{1/}	(fpm)...	3,800	1,340		4,150
Max speed/altitude ^{2/}	(kn)...	130/SL ^{8/}	90/SL		130/SL ^{8/}
LANDING WEIGHT	(lb)...	18,648	19,048		18,648

^{1/} Takeoff power.

^{2/} Normal power.

^{3/} Detailed description of RADIUS and RANGE Missions are given in paragraph 1-25.

^{4/} Includes crew of 2 at 200 lb. each.

^{5/} Carried by single-point or 4-point hoist system.

^{6/} Carried by external sling (load drag-129 sq ft).

^{7/} Transfer of cargo while hovering.

^{8/} Limited by attitude.

Performance Basis:

Data Source: Detail Spec for Army CH-54A.

Performance is based on powers shown in paragraph 1-25.

Data do not include ground effect.

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1-25. Performance Notes, CH-54A (Tarhe).**FORMULA: RADIUS MISSION I**

Warm up, take off, cruise out at sea level at recommended cruise speeds to remote base, and land. Deposit cargo and without refueling, warm up, and take off. At sea level, return to home base at recommended cruise speeds. Range-free allowances are 4 minutes at takeoff power for warmups and takeoffs and 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Warm up, take off, and cruise out at sea level to remote area 100 nautical miles distant at recommended cruise speeds. Hover out of ground effect for 5 minutes to pick up cargo. At sea level, return to home base at recommended cruise speeds. Hover out of ground effect for 5 minutes, to deposit cargo, and land. Range-free allowances are 2 minutes at takeoff power for warmup and takeoff, 10 minutes for hovering, and 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, cruise out at 2000 feet at recommended cruise speeds to remote base and deposit cargo. Without refueling, return to home base at recommended cruise speeds. Range-free allowances are 2 minutes at takeoff power for warmups and takeoffs and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS IV

Warm up, take off, and cruise out at sea level at recommended cruise speeds until only reserve fuel remains. Range-free allowances are 2 minutes at take-

off power for warmup and takeoff and 10 percent of initial fuel for reserve.

GENERAL DATA:

a. Dual engine operation is limited to 6600 SHP by transmission time-power criteria; for single-engine operation, manufacturer's guaranteed ratings in paragraph 1-23 are applicable.

b. Powers used in performance calculations are as follows:

ENGINE: (2) T73-P-1

	SHP	RPM	CRITICAL ALTITUDE
Takeoff:	6600	9000	14,000
Normal:	5400	9000	16,300

c. Maximum overload takeoff weight is limited by the requirement that vertical climb at sea level of a standard day with takeoff power shall not be less than 100 fpm.

d. Maximum alternate takeoff gross weight is 42,000 pounds, at 6600 SHP (2 engines) for hover and takeoff to 20 knots. Above 20 knots, reduce to 6000 SHP.

e. All takeoffs requiring more than 5400 SHP total power shall be logged as a 6600 SHP takeoff. Never exceed speed of 95 knots CAS from SL to 2000 feet density altitude at weights above 38,000 pounds. Above 2000 feet reduce airspeed 6 knots per 1000 feet to a maximum altitude of 6000 feet.

1-27. Loading and Performance Data – Typical Mission, CH-54B (Tarhe)

CONDITIONS	BASIC MISSION I	FERRY MISSION II
TAKEOFF WEIGHT ^{3/} (lb)	47,000	32,323
Fuel (lb)	8,743	8,743
Payload (outbound) ^{4/} (lb)	15,697	—
Payload (inbound) ^{4/} (lb)	—	—
Takeoff Power Loading (lb/bhp)	5.95	4.08
Disk Loading (lb/sq ft)	11.5	7.95
Vertical Rate of Climb at SL ^{1/} (fpm)	—	—
Max Rate of Climb at SL ^{2/} (fpm)	1,350	2,718
Max Rate of Climb (one engine out) ^{1/} (fpm)	491	1,704
Service Ceiling (100 fpm) (ft)	11,000	—
Service Ceiling (one engine out) ^{1/} (ft)	3,000	13,000
Absolute Hovering Ceiling ^{1/} (ft)	—	—
COMBAT RANGE (nmi)	208	232
Average Cruising Speed (kn)	95	95
Cruising Altitude (ft)	SL	SL
Total Mission Time (hrs)	2.2	2.5
COMBAT RADIUS (nmi)	120	—
Average Cruising Speed (kn)	95	—
Cruising Altitude (ft)	SL	—
Total Mission Time (hrs)	2.5	—
FIRST LANDING WEIGHT (lb)	42,500	—
COMBAT WEIGHT (lb)	23,060	—
Combat Altitude (ft)	SL	—
Combat Speed (kn)	105	—
Combat Climb ^{1/} (fpm)	—	—
Combat Ceiling ^{1/} (ft)	—	—
Service Ceiling ^{1/} (ft)	—	—
Absolute Hovering Ceiling ^{1/} (ft)	—	—
Max Rate of Climb at SL ^{1/} (fpm)	—	—
Max Speed/Altitude ^{2/} (kn)	105	—
LANDING WEIGHT (lb)	24,283	24,283

^{1/} Takeoff Power.^{2/} Normal Power.^{3/} Includes crew of 3 at 200 lb each.^{4/} Carried by single-point or 4-point hoist system.

FORMULA: Basic Mission I

Warm up, take off, cruise out at sea level at recommended cruise speeds to remote base, and land. Deposit cargo and without refueling, warm up, and take off. At sea level, return to home base at recommended cruise speeds. Range-free allowances are 4 minutes at takeoff power for warmups and takeoffs and 10 percent of initial fuel for reserve.

FORMULA: Ferry Mission II

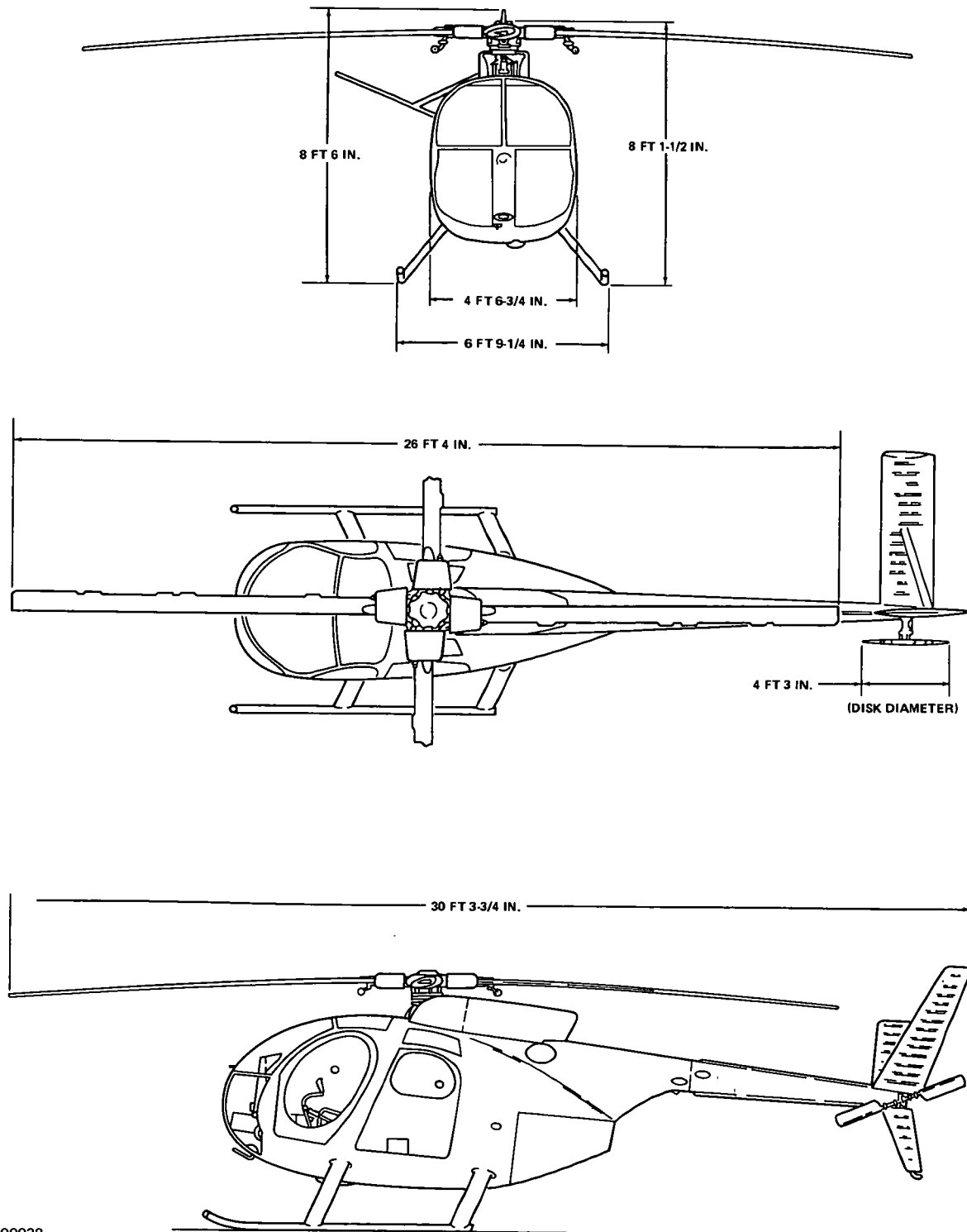
Warm up, take off, and cruise out at sea level at recommended cruise speeds until only reserve fuel remains. Range-free allowances are 2 minutes at takeoff power for warmup and takeoff and 10 percent of initial fuel for reserve.

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Figure 1-10. OH-6A (Cayuse)

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Figure 1-11. Principal dimensions, OH-6A (Cayuse)

1-28. OH-6A (Cayuse) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS
No. & model . . . (1) T63-A-5A Mfr Allison Div of GMC Engine spec No. . 580F, Amend- ment 1, dtd 18 Aug 1965	Mfr's Model: Hughes 500 The principal missions of the OH-6A light observation helicopter are visual observation and target acquisition, reconnaissance, and command control. This helicopter is employed in support of combat companies, and will operate for extended periods of time with only such support as provided by one mechanic with handtools. Normal operation is limited to day or night visual flight conditions. The light observation helicopter is a single-lifting, 4-blade rotor, 4-place helicopter with a normal gross weight of 2400 lb or less. It is powered by a T63-A-5A free turbine engine with 317 SHP, derated to 252.5 SHP. It incorporates dual flight controls with the secondary cyclic control element easily removable. The flight instruments are limited to those required for day and night marginal visual conditions. The cargo area contains troop-type seats which are easily stowable when not in use.		Empty 1158 Useful load 1242 Pilot 200 Observers (2), Copilot (1) 600 Cargo 42 Fuel 400 Gross (FAA certified) 2400 Max structure 2700
ENGINE RATINGS	DEVELOPMENT		FUEL AND OIL
Ratings Takeoff & mil *317 Normal **270 Output speed SFC lb/ SHP. rpm HR Takeoff & mil 6000 0.697 Normal 6000 0.706 Above ratings developed on standard sea level static conditions. *Derated to 252.5 for 5 min **Derated to 214.5	Design competition initiated October 1960 Flight evaluation completed June 1964 Production contract May 1965 First production acft deliveries September 1966		Fuel: Spec. and Grade . MIL-T-5624(JP-4/5) ASTM-1655, Type A or A1 MIL-F-46005A, Type 1 (C.I.T.E.) Qty 61.5 gal Oil: Spec . . . MIL-L-7808/23699 No. tanks . 1 Location. Engine section Qty . . . 3 qt Main Transmission: Spec . . . MIL-L-7808/23699 Qty . . . 8.0 pt Tail Rotor Transmission: Spec . . . MIL-L-7808/23699 Qty . . . 0.5 pt
DIMENSIONS	FEATURES	PERSONNEL	AVIONICS
Rotor dia 26 ft, 4 in. Length: Rotor operating 30 ft, 3-3/4 in. Rotor folded . . . 23 ft Height 8 ft, 6 in. Tread 6 ft, 9-1/4 in.	Dual controls. Stowable troop seats.	Crew (normal) 1 Observer 2 Copilot 1	Refer to chapter 2.
			ARMAMENT
			Refer to chapter 2.

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1-29. Loading and Performance - Typical Mission, OH-6A (Cayuse).

	BASIC MISSION I	ALTERNATE IA (CLEAN) II	ALTERNATE IA (ARMED) III	FERRY RANGE IV	HIGH SPEED SEA LEVEL MISSION V
TAKEOFF WEIGHT (lb) ...	2159	2400	2400 ^{6/}		2159
Fuel (lb) ...	400	400	400		400
Payload (not including pilot) (lb) ...	400	637 ^{4/}	400		400
Takeoff power loading (lb/bhp) ...	8.55	9.50	9.50		8.55
Disk loading (lb/sq ft) ...	3.96	4.41	4.41		3.96
Speed for Min. R/D (knots) ...	54.0	54.0	54.0		54.0
Max rate of climb at sea level ^{1/} (fpm) ...	1925	1560	1560		1925
Speed for max R/C, sea level (knots) ...	56.0	56.0	58.0		56.0
Time: Sea level to 5000 ft ^{1/} (minutes) ...	2.5	3.3	3.3		2.5
Time: Sea level to 10,000 ft ^{1/} (minutes) ...	5.3	7.0	7.0		5.3
Service ceiling (100 fpm) ^{2/} (ft) ...	18,400	15,850	15,850		18,400
Absolute hover ceiling ^{1/} (ft) ...	11,200	6,500	6,500		11,200
COMBAT RANGE (nmi) ...	370	330	316		294
Average cruising speed (knots) ...	104	102	100		129
Cruising altitude (ft) ...	12,200	9600	9500		SL
Total mission time (hr) ...	3.6	3.3	3.2		2.3
COMBAT RADIUS (nmi) ...	185	165	158		147
Average cruising speed (knots) ...	104	102	100		129
Cruising altitude (ft) ...	12,200	9600	9500		SL
Mission time (hr) ...	3.6	3.3	3.2		2.3
COMBAT WEIGHT ^{3/} (lb) ...	1961	2207	2208		1977
COMBAT ALTITUDE (ft) ...	12,200	9600	9500		SL
Combat speed ^{1/} (knots) ...	116	112	112		130
Combat climb ^{1/} (fpm) ...	1860	1680	1680		2220
Service ceiling ^{2/} (ft) ...	20,950	17,850	17,850		20,750
Absolute hover ceiling ^{1/} (ft) ...	14,400	10,500	10,500		14,100
Max rate of climb @ sea level ^{1/} (fpm) ...	2250	1860	1860		2220
Speed for max R/C, sea level (knots) ...	55	56	56		55
Maximum speed ^{1/} (knots) ...	130	128	128		130
Basic speed at 5000 ft ^{1/} (knots) ...	128	117	117		128
LIMIT FLIGHT LOAD FACTORS					
Maneuver Positive (g) ...	2.82	2.54	2.54		2.82
Maneuver Negative (g) ...	0.50	0.50	0.50		0.50

^{1/}Takeoff power up to 5 minutes.^{2/}Normal power.^{3/}For RADIUS mission:^{4/}Includes copilot at 200 lbs.

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1-29. Loading and Performance - Typical Mission, OH-6A (Cayuse) (CONT).

5/Includes 4 Mark XII torso tanks with an empty weight including trapped fuel of 19.5 lb/tank.

6/Includes XM-27 or XM-27E-1 Armament Kit

7/Limited by V_{ne}

Performance Basis:

- a. Army flight test YOH-6A extrapolated.
- b. All performance is out of ground effect and for standard atmospheric conditions.

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1-30. Performance Notes, OH-6A (Cayuse).

FORMULA: RADIUS MISSION I, II, & III

Warm up, take off, climb on course at military power to altitude for best range at average cruise weight. Cruise to remote base at speed for best range. Do not land. Return to home base. Range-free allowances are 2 minutes of normal power for warmup and 10 percent of initial fuel for reserves.

FORMULA: RANGE MISSION I, II, & III

Warm up, take off, and climb on course at military power to altitude for best range at average cruise weight. Cruise to remote base at speed for best range. Range-free allowances are 2 minutes of normal power for warmup and 10 percent of initial fuel for reserve.

FORMULA: FERRY RANGE MISSION IV

Warm up, take off, and climb on course at military power to 5,000 feet. At steady cruise, climb to stay at optimum altitude as weight decreases. Range-free allowance is 2 minutes of normal power for warmup. No reserve fuel allowance.

FORMULA: RADIUS MISSION V

Warm up, take off, and accelerate to maximum speed. Cruise at sea level at maximum speed, as limited by normal power or V_{ne} to remote base. Do not land. Return to home base. Range-free allowances are 2 minutes of normal power for warmup and 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION V

Warm up, take off, and accelerate, to maximum speed. Cruise at sea level at maximum speed, as limited by normal rated power V_{ne} to remote base. Range-free allowances are 2 minutes of normal power for warmup and 10 percent of initial fuel for reserve.

GENERAL DATA

For detailed planning refer to applicable technical manual.

PERFORMANCE REFERENCE

Hughes Tool Company-Standard Aircraft Characteristics (OH-6A).

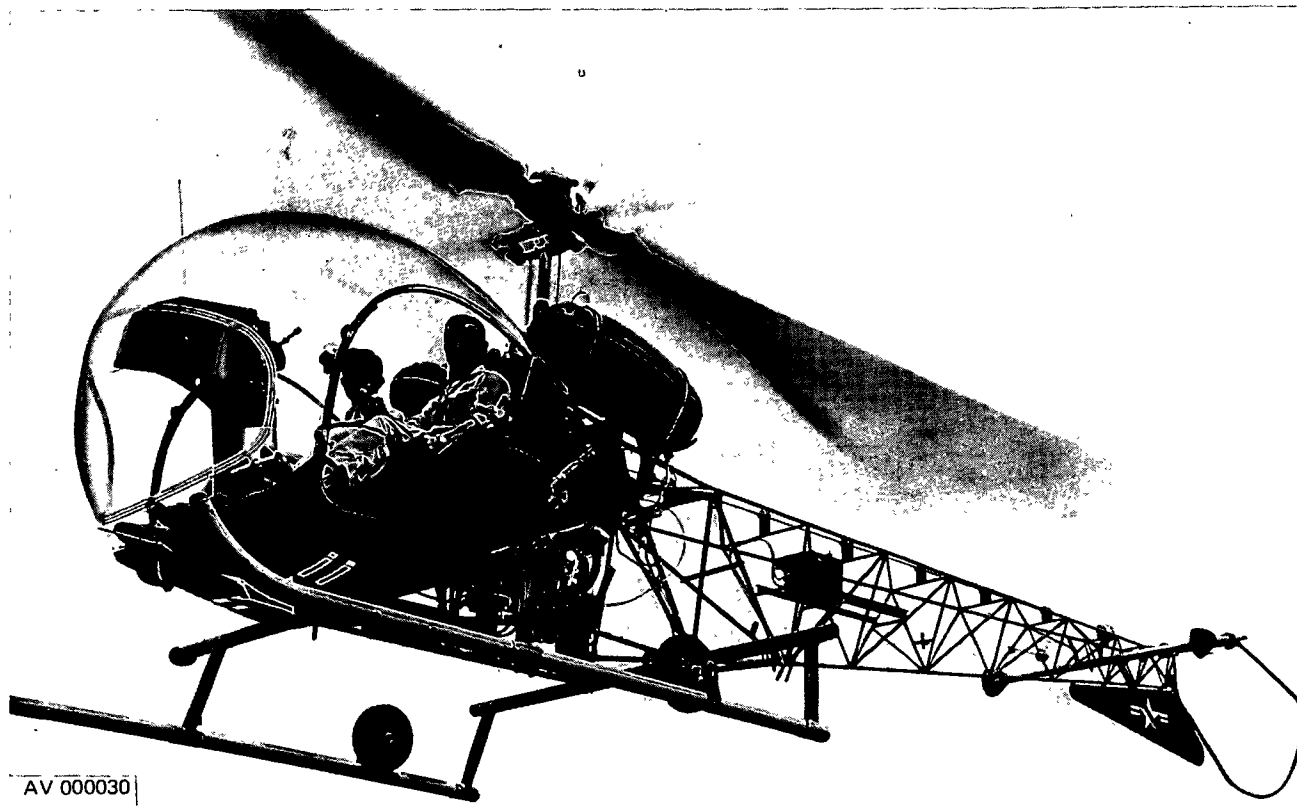
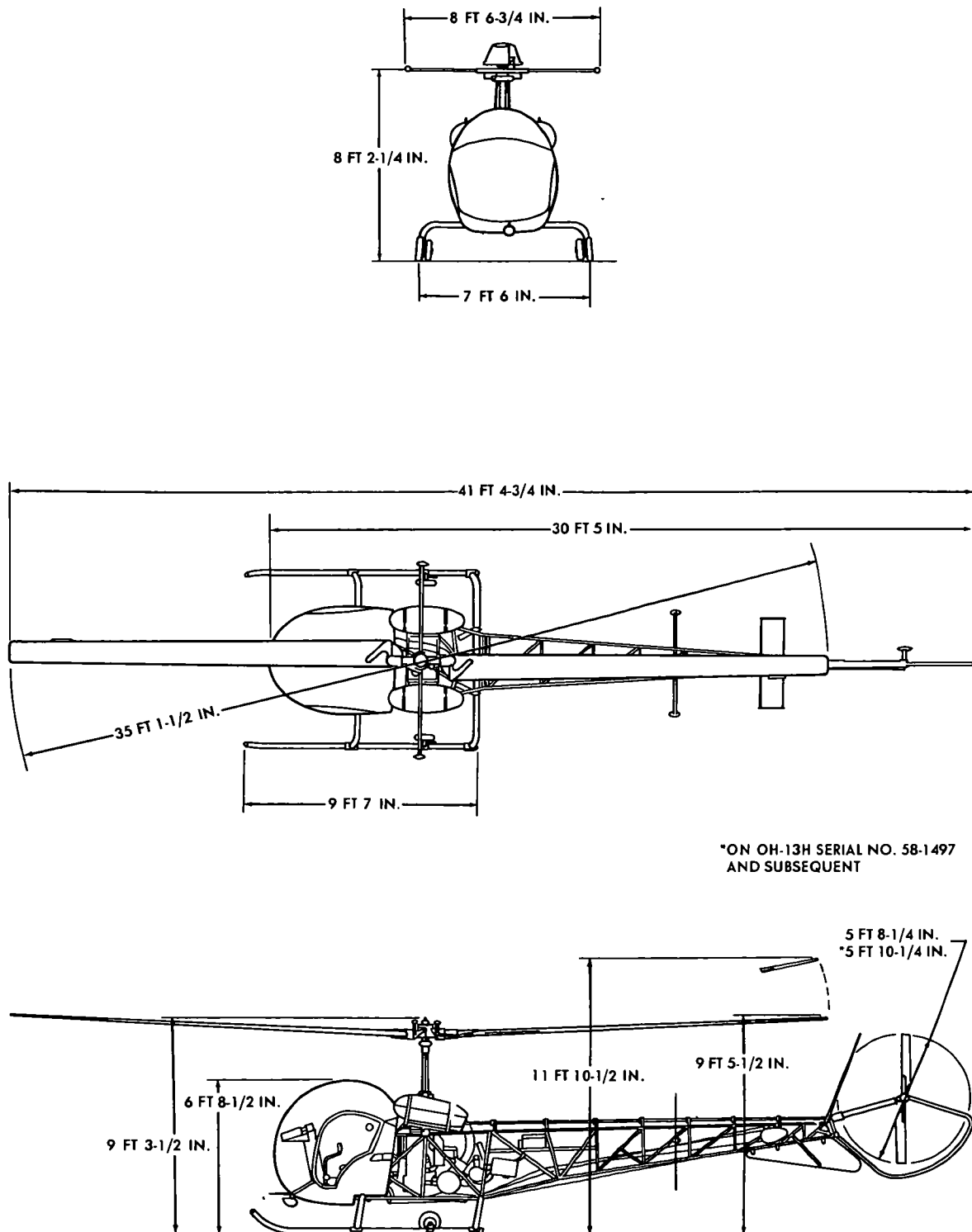


Figure 1-12. OH-13H, and S (Sioux) typical (minor differences apparent between H and S models)

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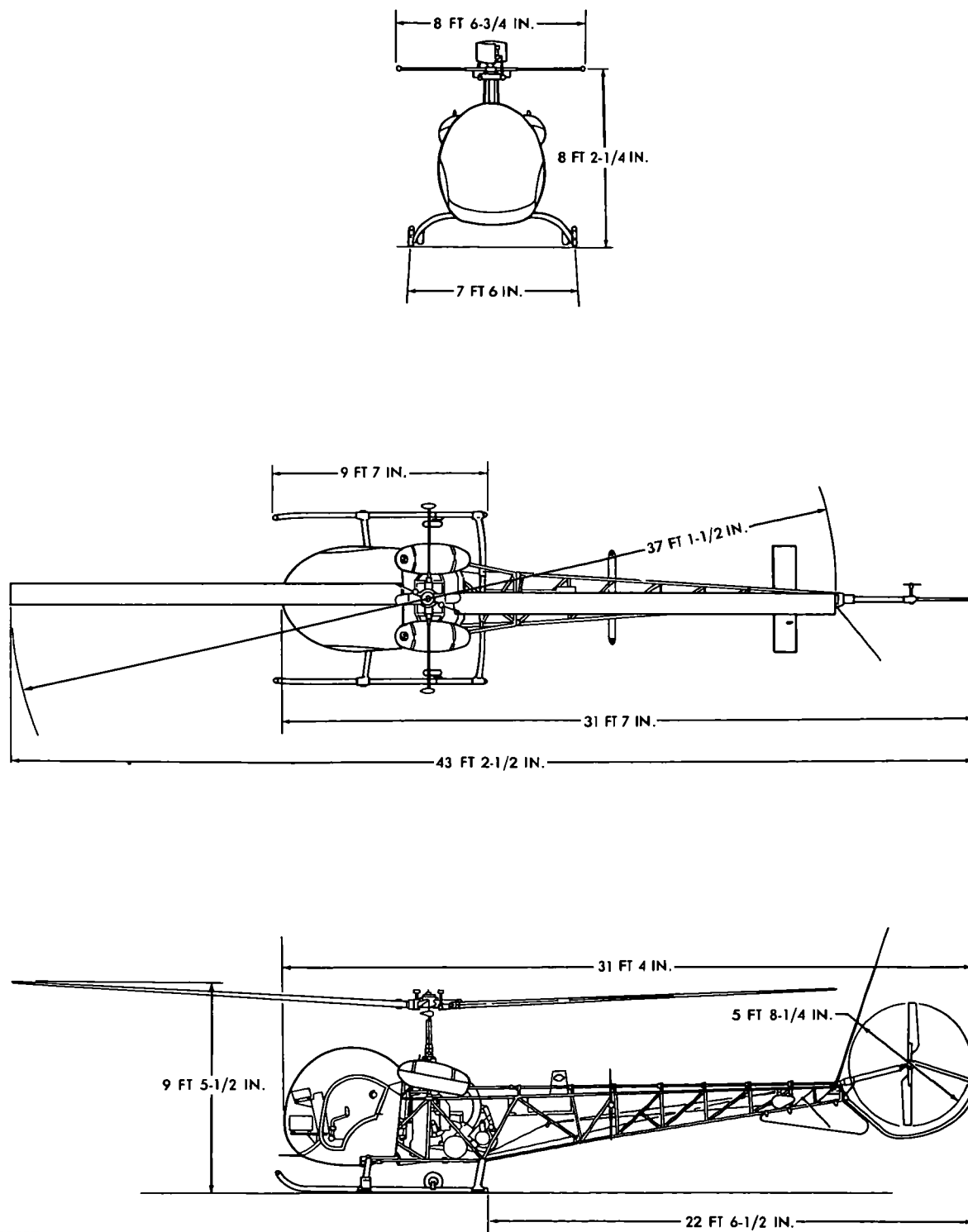


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Figure 1-13. Principal dimensions, OH-13H (Sioux)

1-31. OH-13H (Sioux) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model (1) O-435-23C Mfr Lycoming Engine spec No . . . 2221B Red. gear ratio . . . D.D.	Mfr's Model: Bell 47G-2 The principal missions of the OH-13H are observation, training, reconnaissance, and general utility. The OH-13H incorporates a 2-blade main rotor and a 2-blade tail rotor with a hydraulically boosted cyclic control system. The fuselage is an open-tube configuration with a bubble-type canopy enclosure. The landing gear is of the skid-type, with ground handling wheels attached. Provisions have been included for installation of a float-type landing gear.		LB L.F. Empty (actual) 1850 Design 2450 2.5 Overload 2750	
ENGINE RATINGS	DEVELOPMENT		FUEL AND OIL	
BHP RPM ALT MIN Takeoff 260 3400 SL 5 Normal 250 3200 SL Cont.	Similar to the OH-13G except for the O-435-23C engine in lieu of the O-335-5D engine and metal rotor blades. The metal main rotor blades are of constant chord with an increased twist which increases responsiveness to collective control movements. Date of contract January 1956 First flight January 1956 First acceptance June 1956 Production completed June 1960		Fuel: Grade 80/87 Spec MIL-G-5572 No. tanks 2 Location Fuselage Qty 41-1/2 gal Oil: Spec MIL-L-22851 No. tanks 1 Location Engine section Qty 3 gal	
DIMENSIONS	FEATURES	PERSONNEL	AVIONICS	
Rotor dia 35 ft, 1-1/2 in. Length: Rotors operating 41 ft, 4-3/4 in. Rotors static . . 41 ft, 4-3/4 in. Fuselage 31 ft, 4-3/4 in. Span (max lateral) 8 ft, 6-3/4 in. Height 9 ft, 5-1/2 in. Tread 7 ft, 6 in. Rotor gnd clearance (static) 8 ft, 8-1/2 in. (idling) 8 ft, 8-1/2 in.	Float landing gear (prov). Winterization kit (prov). Dual controls (prov). Night flying equipment. M2 armament subsystem. Extended range torso tank (prov).	Crew (normal) 1 Passengers/observers *2 or Litters (ext) 2 *Limited to 1 when dual controls are installed.	Refer to chapter 2.	
			ARMAMENT	
			Refer to chapter 2.	



AV 000037

Figure 1-14. Principal dimensions, OH-13S (Sioux)

1-32. OH-13S (Sioux) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model . . (1) O-435-25A Mfr Lycoming Engine spec No. 2309A Red. gear ratio . D.D.	Mfr's Model: Bell 47G3-B The principal missions of the OH-13S are observation, reconnaissance, and general utility. The OH-13S incorporates a 2-blade main rotor and a 2-blade tail rotor with a hydraulically boosted cyclic control system. The fuselage is an open-tube configuration with a bubble-type cockpit enclosure. The landing gear is of the skid-type, with ground handling wheels attached.		Empty (actual) 1980 LB L.F. Design 2850 2.5	
ENGINE RATINGS			FUEL AND OIL	
BHP RPM ALT MIN Takeoff 270 3200 SL 5 Normal 220 3200 SL Cont.	DEVELOPMENT Similar to the OH-13H except for the O-435-25A turbocharged engine in lieu of the naturally aspirated O-435-23C engine. Main rotor diameter has been increased 2 feet. Increased main rotor disk matches rotor with engine for higher altitude performance, more maneuverability, and less susceptibility to turbulence. Gross weight of the OH-13S has been increased to 2850 lb and fuel capacity increased to 57 gal.		Fuel: Grade 100/130 Spec MIL-G-5572 No. tanks 2 Location Fuselage Qty 57 gal Oil: Spec MIL-L-22851 No. tanks 1 Location Engine section Qty 3-1/2 gal	
DIMENSIONS			AVIONICS	
Rotor dia 37 ft, 1-1/2 in. Length: Rotors operating . . . 43 ft, 2-1/2 in. Rotors static . . 43 ft, 2-1/2 in. Fuselage 31 ft, 8-1/2 in. Span (max lateral) 8 ft, 6-3/4 in. Height 9 ft, 5-1/2 in. Tread 7 ft, 6 in. Rotor gnd clearance (static) 8 ft, 8-1/2 in. (idling) 8 ft, 8-1/2 in.	FEATURES	PERSONNEL	ARMAMENT	
	Dual controls (prov). Night flying equipment. M2 armament subsystem. Extended range torso tank (prov).	Crew (normal) 1 Passengers/observers *2 *Limited to 1 when dual controls are installed.	Refer to chapter 2.	

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1-33. Loading and Performance - Typical Mission, OH-13 (Sioux).

MODEL	E	G	H	S	T
Mission weight (lb)	2500	2500	2750	2850	2950
Empty weight (lb)	1630	1630	1850	1980	2060
Useful load (lb)	870	870	900	870	890
Fuel load (lb)	174	246	246	342	342
Oil load (lb)	15	15	18	22	22
Payload (lb)	681	610	640	510	533
Max endurance at sea level (hr)	2.6	3.8	3.0	3.7	3.5
Max range at 5000 ft (miles)	172	246	224	203	192
Max R/C (ft/min)	801	801	720	975	900
HOGC ceiling (ft)	500	500	300	10,800	8400
HIGE ceiling (ft)	3800	3800	3400	12,000+	12,000+
Service ceiling (ft)	10,300	10,300	8900	12,000+	12,000+
Takeoff power (hp)	210	210	240	270	270
Military power (hp)	210	210	220	220	220
Cont power (hp)	210	210	220	220	220
Turbocharged	no	no	no	yes	yes
Speed- V_{ne} (kn)	85	87	87	91	91
Main rotor					
Disk area (sq ft)	968.5	968.5	968.5	1085	1085
Blade area (sq ft)	35.4	35.4	32.2	34.27	34.27
Disk load (psf)	2.57	2.57	2.84	2.63	2.72
Blade load (psf)	70.4	70.4	85.1	83.2	86.1
Solidity	0.0370	0.0370	0.0332	0.0314	0.0314
Tip speed (fps) (3200 rpm)	654	654	654	695	695
Tail rotor					
Disk area (sq ft)	26.8	26.8	26.8	26.8	26.8
Blade area (sq ft)	2.4	2.4	2.4	2.4	2.4
Solidity	0.0895	0.0895	0.0895	0.0895	0.0895
Tip speed (fps)	587	587	587	587	587



Figure 1-15. OH-23D, and G (Raven), typical (minor differences apparent between D and G models)

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1-34. OH-23D (Raven) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model ... (1) O-435-23C Mfr Lycoming Engine spec No . 2221 Red. gear ratio . D.D. Eng/main rotor gear ratio 8.66:1	Mfr's Model: Hiller UH-12D		Empty (actual) ...	LB L.F. 1772
	The principal mission of the OH-23D is pilot training. Alternate missions are observation and medical evacuation.		Basic (actual)	1781
	The OH-23D is a three-place, side-by-side helicopter with a single main rotor, an antitorque tail rotor, skid-type landing gear and two external litters. The control system consists of a single set of controls operated from the center seat, with provisions for a second set operated from the left seat. A trim system is incorporated with the cyclic control stick for longitudinal and lateral trim. The fuselage is of all-metal, semimonocoque construction		Design	2700 3.0
			Combat	*2350
			Max takeoff (overload)	+2700 3.0
			Max takeoff (normal)	+2700 3.0
			Max landing	+2700 4.0
			* For basic mission.	
			+ Limited by structure.	
ENGINE RATINGS	DEVELOPMENT		FUEL AND OIL	
BHP RPM ALT MIN Takeoff 255 3400 SL Cont. *Normal 245 3200 SL Cont. * METO power (max except takeoff)	The OH-23D is similar to the OH-23C except for the VO-435-23C engine, redesigned all-metal main and tail rotor blades, increase of design gross weight, and a new transmission and drive system.		Fuel:	
	Date of contract September 1956		Grade	
	First flight October 1956		Spec	
	First acceptance December 1957		No. tanks	
	First service use January 1958		Location	
			Qty	
			Oil:	
			Grade	
			Spec	
			No. tanks	
			Location	
			Qty	
DIMENSIONS	FEATURES	PERSONNEL	AVIONICS	
Rotor dia 35 ft, 5 in. Length: Rotors operating ... 40 ft, 8-1/2 in. Rotors static .. 40 ft, 8-1/2 in. Fuselage 27 ft, 9-1/2 in. Span (max lateral) 10 ft Height 10 ft, 1-1/2 in. Tread 7 ft, 6 in. Rotor gnd clearance: Static 6 ft, 4 in. Idling 9 ft, 3-1/2 in.	External litters. Rotomatic control. Ground handling wheels. Dual controls (prov). Transportable in C-124 and C-133 aircraft. Interchangeable main rotor and tail rotor blades.	Crew 1 Passenger 2 or Crew 1 Student pilot 1 or Crew 1 Litters (ext) 2 or Crew 1 Litters (ext) 1 Attendant 1	Refer to chapter 2.	
			ARMAMENT	
			Refer to chapter 2.	

1-35. Loading and Performance - Typical Mission, OH-23D (Raven).

CONDITIONS	BASIC MISSION	EVACUATION	FERRY RANGE
	I	II	III
TAKEOFF WEIGHT (lb) ...	2478 ^{4/}	2356 ^{5/}	2278 ^{5/}
Fuel at 6.0 lb/gal (grade 115/145)..... (lb) ...	280	280	280
Payload (outbound) (lb) ...	None	None	None
Payload (inbound) (lb) ...	None	460	None
Takeoff power loading (lb/bhp) ...	10.1	9.6	9.3
Disk loading (lb/sq ft) ...	2.52	2.39	2.31
Autorotation speed (min R/D) (kn) ...	43	43	43
Takeoff ground run at SL ^{1/} (ft) ...	0	0	0
Takeoff to clear 50 ft ^{1/} (ft) ...	210	180	130
Vertical rate of climb at SL ^{1/} (fpm) ...	630	850	980
Max rate of climb at SL ^{1/} (fpm) ...	1250	1320	1450
Speed for max rate of climb at SL ^{1/} (kn) ...	41	42	43
Time: SL to 5000 ft ^{1/} (min) ...	5.0	4.2	3.8
Service ceiling (100 fpm) ^{1/} (ft) ...	16,100	16,700	17,800
Absolute hovering ceiling ^{1/} (ft) ...	4000	5550	6500
COMBAT RANGE ^{2/} (nmi) ...	177	....	184
Average cruising speed (kn) ...	70	....	70
Cruising altitude (ft) ...	5000	....	5000
Total mission time (hr) ...	2.6	....	2.7
COMBAT RADIUS ^{2/} (nmi) ...	82	73	....
Average cruising speed (kn) ...	70	60	....
Cruising altitude (ft) ...	5000	5000	....
Total mission time (hr) ...	2.4	2.5	....
FIRST LANDING WEIGHT ^{3/} (lb) ...	2350	2233	....
Ground roll at SL (power on/autorotation) (ft) ...	0/368	0/335	....
Total from 50 ft (power on/autorotation) (ft) ...	0/474	0/443	....
COMBAT WEIGHT ^{3/} (lb) ...	2350	269 ²	2026
Combat altitude (ft) ...	5000	5000	5000
Combat speed ^{1/} (kn) ...	70	56	70
Combat climb ^{1/} (fpm) ...	955	630	1330
Combat ceiling (500 fpm) ^{1/} (ft) ...	12,100	7050	16,350
Service ceiling (100 fpm) ^{1/} (ft) ...	17,600	12,430	21,650
Absolute hovering ceiling ^{1/} (ft) ...	5600	1510	9700
Takeoff ground run at SL ^{1/} (ft) ...	0	0	....
Takeoff to clear 50 ft ^{1/} (ft) ...	155	305	
Max rate of climb at SL ^{1/} (fpm) ...	1380	1000	1750

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1-35. Loading and Performance - Typical Mission, OH-23D (Raven) (CONT).

CONDITIONS	BASIC MISSION	EVACUATION	FERRY RANGE
	I	II	III
Speed for max rate of climb at SL ^{1/} (kn) ...	41	38	41
Max speed at SL ft ^{1/} (kn) ...	83	66 ^{6/}	83
Basic speed at 5000 ft ^{1/} (kn) ...	77 ^{6/}	60 ^{6/}	77 ^{6/}
LANDING WEIGHT ^{1/} (lb) ...	2226	2564	2026
Ground roll at SL (power on/autorotation) (ft) ...	0/361	0/388	0/359
Total from 50 ft (power on/autorotation) (ft) ...	0/470	0/453	0/464

^{1/}METO power.

^{2/}Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-36.

^{3/}For RADIUS mission if radius is shown.

^{4/}Includes crew of 2 at 400 lb.

^{5/}Includes crew of 1 at 200 lb.

^{6/}Limited by stall.

Performance Basis:

- Data source: Calculated data based on UH-12D flight tests.
- Performance is based on powers shown.
- Data do not include ground effect except for takeoff and landing.

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1-36. Performance Notes, OH-23D (Raven).**FORMULA: RADIUS MISSION I**

Warm up, take off, climb on course to 5000 feet at METO power, cruise out at long range speed to remote base, and land. Without refueling and with no change in payload, warm up, take off, climb on course to 5000 feet at METO power, and return at long range speed. Range-free allowances are 10 minutes of METO power at sea level for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Warm up, take off, climb on course to 5000 feet at METO power, cruise out at long range speed to remote base, land, and load two litter patients. Without refueling, warm up, take off, climb on course to 5000 feet at METO power, and return at long range speed. Range-free allowances are 10 minutes for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS I & III

Warm up, take off, climb on course to 5000 feet at METO power, and cruise out at long range speed

until 90 percent of initial fuel is consumed. Range-free allowances are 5 minutes of METO power at sea level for warmup and takeoff plus 10 percent of initial fuel for reserve.

GENERAL NOTES

Engine ratings shown are manufacturer's guaranteed ratings. METO values used in performance calculations are as follows:

ALT	RPM	BHP FOR	
		BHP FOR HOVER	FORWARD FLIGHT
SL	3200	246.0	248.0
5000 ft . . .	3200	207.5	209.5
10,000 ft .	3200	174.0	176.0

PERFORMANCE REFERENCES

Hiller Report No. 58-61. Characteristics Performance.

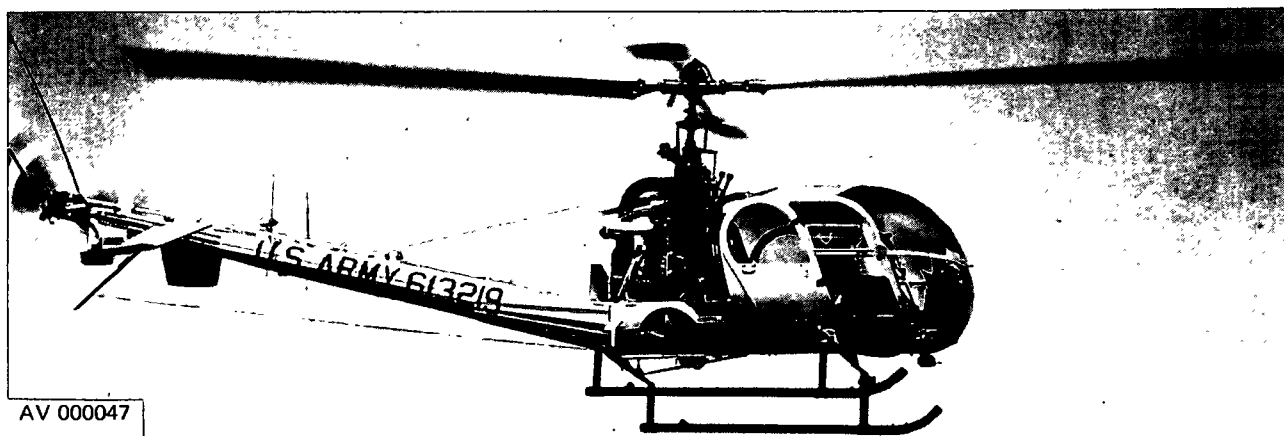
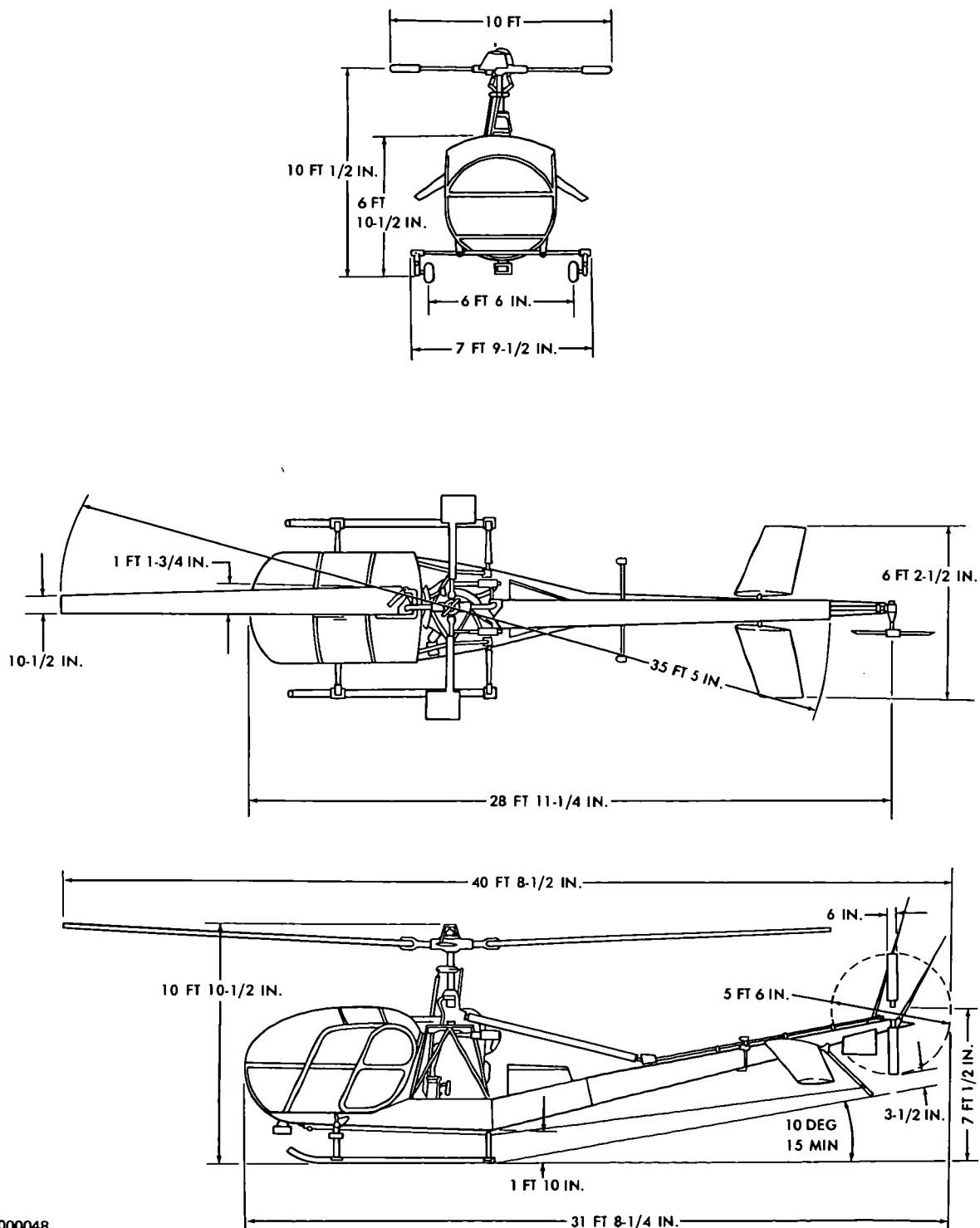


Figure 1-17. OH-23F (Raven)

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Figure 1-18. Principal dimensions, OH-23F (Raven)

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1-37. OH-23F (Raven) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & Model (1) O-540-9 Mfr Lycoming Engine spec No . . . 2304 Red. gear ratio . . . D.D. Engine/main rotor gear ratio 8.66:1	Mfr's Model: Hiller E4 The principal mission of the OH-23F is geodetic survey. The OH-23F is a four-place helicopter with a single main rotor, an antitorque tail rotor, and skid-type landing gear. The control system consists of a single set of controls operated from the forward seat. A trim system is incorporated with the cyclic control stick for longitudinal and lateral trim. The fuselage is of all-metal, semimonocoque construction. Seating arrangement is with the pilot forward and three passengers aft, side-by-side.		Empty (actual) . . . 1903 Basic (actual) . . . 1903 Design 2800 Combat *2530	L.B. L.F. 3.0
ENGINE RATINGS BHP RPM ALT MIN Takeoff 305 3200 SL Cont. *Normal 305 3200 SL Cont. *METO power.	DEVELOPMENT The OH-23F is similar to the OH-23D except for a passenger capacity and the O-540-9 engine. The O-540-9 engine increases performance.		Max takeoff (overload) +2800 Max takeoff (normal) +2800 Max landing +2800 *For basic mission. +Limited by structure.	3.0 3.0 4.0
DIMENSIONS Rotor dia 35 ft, 5 in. Length: Rotors operating 40 ft, 8-1/2 in. Rotors static . . . 40 ft, 8-1/2 in. Fuselage 31 ft, 8-1/4 in. Span (max lateral) 10 ft Height 10 ft, 10-1/2 in. Tread 7 ft, 6 in. Rotor gnd clearance: Static 6 ft, 4 in. Idling 9 ft, 3-1/2 in.	Date of contract October 1959 First flight January 1960 First acceptance January 1960 Production status Completed		FUEL AND OIL Fuel: Grade 115/145 Spec MIL-G-5572 No. tanks 1 Location Fuselage Qty 46 gal Oil: Grade 1100 Spec MIL-L-6082 No. tanks 1 Location Fuselage Qty 3-1/3 gal	
	FEATURES Rotomatic control. Gnd handling wheels. Transportable in C-124 and C-133 aircraft. Interchangeable main rotor and tail rotor blades.	PERSONNEL Crew (normal) 1 Passenger 3	AVIONICS Refer to chapter 2.	ARMAMENT Refer to chapter 2.

1-38. Loading and Performance - Typical Mission, OH-23F (Raven).

CONDITIONS	BASIC AND DESIGN MISSION
TAKEOFF WEIGHT (lb)...	2800
Fuel at 6.0 lb/gal (grade 115/145) (lb)...	516
Payload (outbound) (lb)...	200
Payload (inbound) (lb)...	200
Takeoff power loading (lb/bhp)...	9.2
Disk loading (lb/sq ft)...	282
Autorotation speed (min R/D) (kn)...	45
Takeoff ground run at SL ^{1/} (ft)...	0
Takeoff to clear 50 ft ^{1/} (ft)...	0
Vertical rate of climb at SL (fpm)...	750
Max rate of climb at SL (fpm)...	1380
Speed for max rate of climb at SL (kn)...	46
Time: SL to 5000 ft (min)...	36
Service ceiling (100 fpm) (ft)...	17,600
Absolute hovering ceiling (ft)...	7200
COMBAT RANGE ^{2/} (nmi)...	282
Average cruising speed (kn)...	78
Cruising altitude (ft)...	5000
Total mission time (hr)...	3.7
COMBAT RADIUS ^{2/} (nmi)...	141
Average cruising speed (kn)...	78
Cruising altitude (ft)...	5000
Total mission time (hr)...	3.5
FIRST LANDING WEIGHT ^{3/} (lb)...	2530
Ground roll at SL (power on/autorotation) (ft)...	0/275
Total from 50 ft (power on/autorotation) (ft)...	0/400
COMBAT WEIGHT ^{3/} (lb)...	2530
Combat altitude (ft)...	5000
Combat speed ^{1/} (kn)...	78
Combat climb ^{1/} (fpm)...	1510
Combat ceiling (500 fpm) ^{1/} (ft)...	16,100
Service ceiling (100 fpm) ^{1/} (ft)...	20,000
Absolute hovering ceiling ^{1/} (ft)...	10,000
Takeoff ground run at SL ^{1/} (ft)...	0
Takeoff to clear 50 ft ^{1/} (ft)...	0
Max rate of climb at SL ^{1/} (fpm)...	1620
Speed for max rate of climb at SL ^{1/} (kn)...	46
Max speed at SL ft ^{1/} (kn)...	83
Basic speed at 5000 ft ^{1/} (kn)...	78 ^{4/}
LANDING WEIGHT ^{3/} (lb)...	2310
Ground roll at SL (power on/autorotation) (ft)...	0/275
Total from 50 ft (power on/autorotation) (ft)...	0/400

^{1/}METO power.^{2/}Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-39.^{3/}For Radius Mission if radius is shown.^{4/}Limited by stall.

1-39. Performance Notes, OH-23F (Raven).**FORMULA: RADIUS MISSION II**

Warm up, take off, climb on course to 5000 feet at METO power, cruise out at long range speed to remote base, and land. Without refueling and with no change in payload, warm up, take off, climb on course to 5000 feet at METO power, and return at long range speed. Range-free allowances are 10 minutes of METO power at sea level for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION I

Warm up, take off, climb on course to 5000 feet at METO power, and cruise out at long range speed until 90 percent of initial fuel is consumed. Range-free allowances are 5 minutes of METO power at sea level for warmup and takeoff plus 10 percent of initial fuel for reserve.

GENERAL NOTES

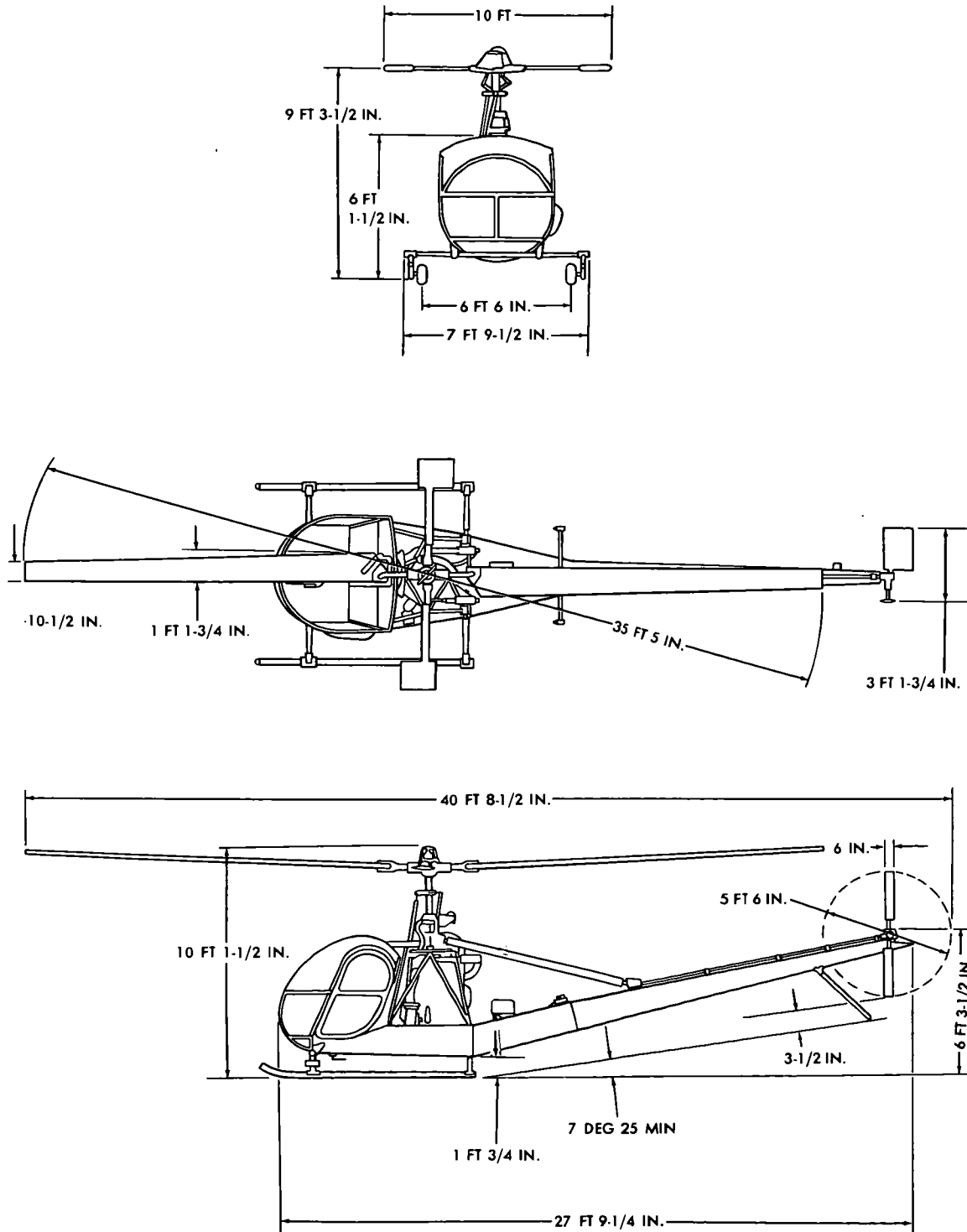
Engine ratings listed in paragraph 1-37 are manufacturer's guaranteed ratings. METO power values used in performance calculations are as follows:

ALT	RPM	BHP FOR	
		HOVER	FORWARD FLIGHT
SL	3200	305	305
5000 ft . . .	3200	282	282
10,000 ft .	3200	238	238

PERFORMANCE REFERENCE

Commercial and military technical manuals.

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Figure 1-19. Principal dimensions, OH-23G (Raven)

1-40. OH-23G (Raven) Characteristics.

POWERPLANT					MISSION AND DESCRIPTION		WEIGHTS	
No. & model (1) O-540-9					Mfr's Model: Hiller UH-12E		Empty (actual)	LB L.F.
Mfr Lycoming					The principal mission of the OH-23G is armed reconnaissance. Alternate missions are training and medical evacuation. The OH-23G is a three-place, side-by-side helicopter with a single main rotor, an antitorque tail rotor, and skid-type landing gear. The control system consists of a single set of controls operated from the center seat with provisions for a second set operated from the left seat. A trim system is incorporated with the cyclic control stick for longitudinal lateral trim. The fuselage is of all-metal, semimonocoque construction.		Basic (actual)	1903
Engine spec No 2304							Design	2800 3.0
Red. gear ratio D.D.							Combat	*2650
Eng/main rotor							Max takeoff	
gear ratio 8.66:1							(overload)	+2800 3.0
ENGINE RATINGS							Max takeoff	
BHP RPM ALT MIN							(normal)	+2800 3.0
Takeoff 305 3200 SL Cont.							Max landing	+2800 4.0
*Normal 305 3200 SL Cont.					DEVELOPMENT		*For basic mission.	
*METO power.					The OH-23G is similar to the OH-23D except for the O-540-9 engine. The O-540-9 engine increases performance.		+Limited by structure.	
DIMENSIONS							FUEL AND OIL	
Rotor dia 35 ft, 5 in.					Date of contract October 1962		Fuel:	
Length:					First flight July 1963		Grade 115/145	
Rotors					First acceptance August 1963		Spec MIL-G-5572	
operating 40 ft, 8-1/2 in.					Production status Completed		No. tanks 1	
Rotors static . . . 40 ft, 8-1/2 in.							Location Fuselage	
Fuselage 27 ft, 9-1/2 in.							Qty 46 gal	
Span (max					FEATURES		Oil:	
lateral) 10 ft					External litters.		Grade 1100	
Height 10 ft, 1-1/2 in.					Rotormatic control.		Spec MIL-L-6082	
Tread 7 ft, 6 in.					Gnd handling wheels.		No. tanks 1	
Rotor gnd clearance:					Dual controls (prov).		Location Fuselage	
Static 6 ft, 4 in.					Transportable in C-124		Qty 3-1/3 gal	
Idling 9 ft, 3-1/2 in.					and C-133 aircraft.			
					Interchangeable main rotor		AVIONICS	
					and tail rotor blades.		Refer to chapter 2.	
							ARMAMENT	
							Refer to chapter 2.	

1-41. Loading and Performance - Typical Mission, OH-23G (Raven).

CONDITIONS	BASIC AND DESIGN MISSION I	EVACUATION II	TRAINING III
TAKEOFF WEIGHT	2800 ^{4/}	2400 ^{5/}	2600
Fuel at 6.0 lb/gal (grade 115/145)	276	230	276
Payload (outbound)	214	55	None
Payload (inbound)	140	400	None
Takeoff power loading	9.2	9.2	8.5
Disk loading	2.82	2.82	2.62
Autorotation speed (min R/D)	45	45	45
Takeoff ground run at SL ^{1/}	0	0	0
Takeoff to clear 50 ft ^{1/}	0	0	0
Vertical rate of climb at SL ^{1/}	750	750	1090
Max rate of climb at SL ^{1/}	1380	1380	1510
Speed for max rate of climb at SL ^{1/}	46	46	46
Time: SL to 5000 ft ^{1/}	3.6	3.6	3.2
Service ceiling (100 fpm) ^{1/}	17,600	17,600	18,100
Absolute hovering ceiling ^{1/}	7200	7200	10,000
COMBAT RANGE ^{2/}	152	....	155
Average cruising speed	78	....	78
Cruising altitude	5000	....	5000
Total mission time	2.1	....	1.9
COMBAT RADIUS ^{2/}	70	65	73
Average cruising speed	78	65	78
Cruising altitude	5000	5000	5000
Total mission time	1.9	2.0	1.8
FIRST LANDING WEIGHT ^{3/}	2650	2275	2475
Ground roll at SL (power on/autorotation)	0/275	0/275	0/275
Total from 50 ft (power on/autorotation)	0/400	0/400	0/400
COMBAT WEIGHT	2650	2675	2475
Combat altitude	5000	5000	5000
Combat speed ^{1/}	78	65	78
Combat climb ^{1/}	1420	1350	1560
Combat ceiling (500 fpm) ^{1/}	14,400	14,400	15,500
Service ceiling (100 fpm) ^{1/}	19,200	18,800	20,000
Absolute hovering ceiling ^{1/}	9200	9000	10,000
Takeoff ground run at SL ^{1/}	0	0	0
Takeoff to clear 50 ft ^{1/}	0	0	0
Max rate of climb at SL ^{1/}	1515	1500	1660
Speed for max rate of climb at SL ^{1/}	46	46	46
Max speed at SL ft ^{1/}	83	65 ^{6/}	83
Basic speed at 5000 ft ^{1/}	78 ^{6/}	65 ^{6/}	78
LANDING WEIGHT ^{3/}	2475	2550	2350
Ground roll at SL (power on/autorotation)	0/275	0/275	0/275
Total from 50 ft (power on/autorotation)	0/400	0/400	0/400

^{1/}METO power.^{2/}Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-42.^{3/}For RADIUS mission if radius is shown.^{4/}Includes crew of 2 at 400 lb.^{5/}Includes crew of 1 at 200 lb.^{6/}Limited by stall.

1-42. Performance Notes, OH-23G (Raven).**FORMULA: RADIUS MISSIONS I & III**

Warm up, take off, climb on course to 5000 feet at METO power, cruise out at long range speed to remote base, and land. Without refueling and with no change in payload, warm up, take off, climb on course to 5000 feet at METO power, and return at long range speed. Range-free allowances are 10 minutes of METO power at sea level for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Warm up, take off, climb on course to 500 feet at METO power, cruise out at long range speed to remote base, land, and load two litter patients. Without refueling, warm up, take off, climb on course to 5000 feet at METO power, and return at long range speed. Range-free allowances are 10 minutes for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS I & III

Warm up, take off, climb on course to 5000 feet at METO power, and cruise out at long range speed

until 90 percent of initial fuel is consumed. Range-free allowances are 5 minutes of METO power at sea level for warmup and takeoff plus 10 percent of initial fuel for reserve.

GENERAL NOTES:

Engine ratings listed in paragraph 1-40 are manufacturer's guaranteed ratings. METO power values used in performance calculations are as follows:

ALT	RPM	BHP FOR	
		HOVER	FORWARD FLIGHT
SL	3200	305	305
5000 ft . . .	3200	282	282
10,000 ft	3200	238	238

PERFORMANCE REFERENCES:

Commercial and military technical manuals.

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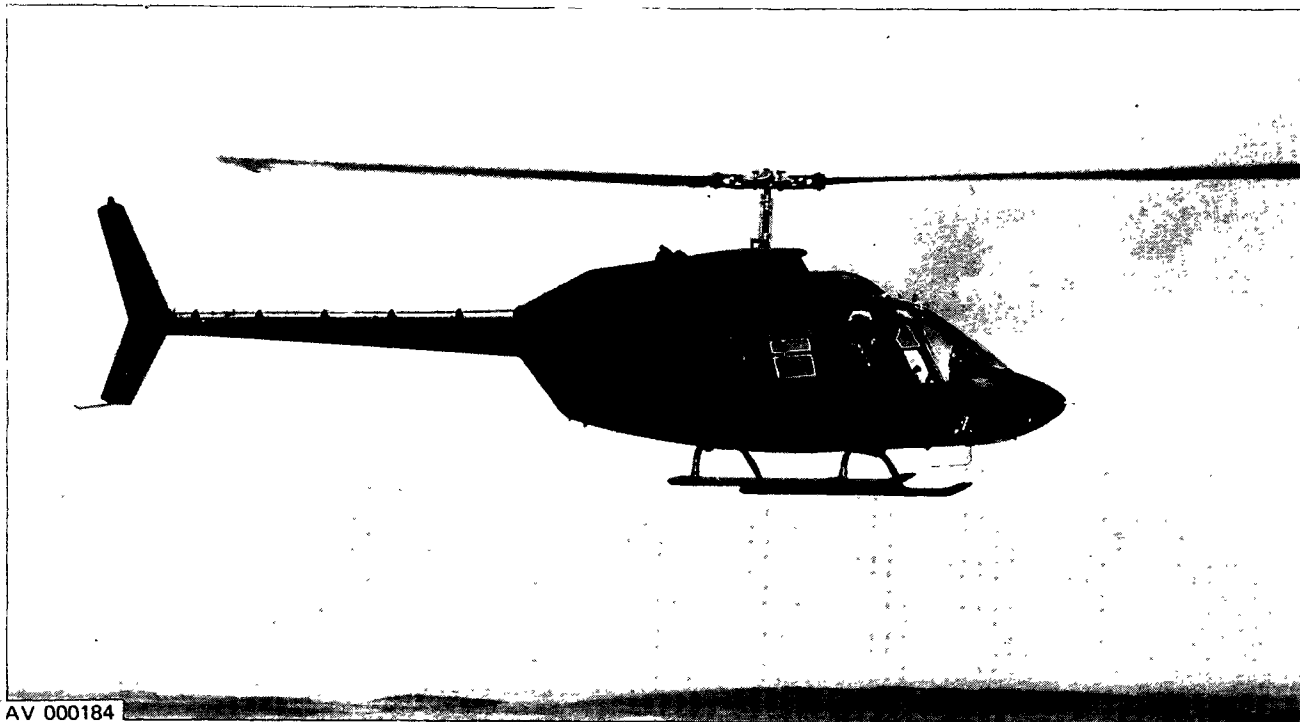
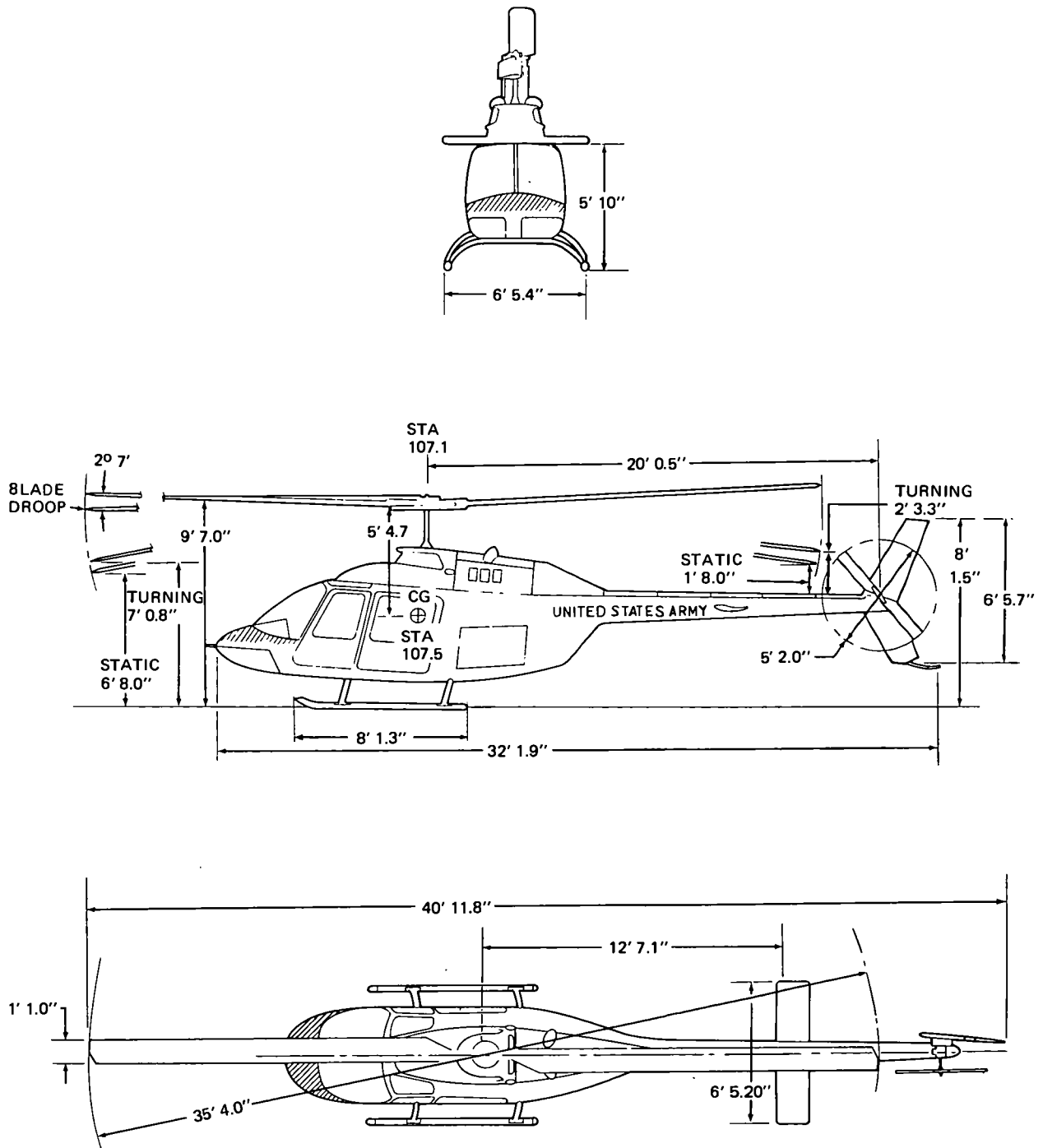


Figure 1-20. OH-58A, Light observation helicopter (Kiowa)



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Figure 1-21. Principal dimensions, OH-58A (Kiowa)

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1-43. OH-58A (Kiowa) Characteristics.

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POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model .. (1) T63-A-700	Mfg's Model: Bell 206A The missions for which the OH-58A Helicopter shall be employed are: visual observation, target acquisition, reconnaissance, and command control. The helicopter shall be readily adaptable to utility tasks at the combat company level without use of special kits or special attachments. The helicopter shall be organic to division, brigade, battalion, or equivalent level, and be capable of continuous daily operation in the forward area, with maximum availability to the tactical commander. Normal operations shall be limited to day and night visual and marginal visual flight conditions. The OH-58A can perform an unarmed observation mission with a 260 mile range or 3.0 hour endurance at a takeoff gross weight of 2760 pounds. It can perform a scout mission, armed with the XM-27E-1 weapon system and 2000 rounds of ammunition, with a range at 230 miles at a takeoff gross weight of 2967 pounds. This helicopter is the single engine, single main rotor type. The fuselage is divided into three main sections, the forward section which provides the cabin and fuel cell enclosure as well as the pylon support, the intermediate section supports the engine provides the equipment and electronics compartments, and the tail boom which supports the horizontal stabilizer, the vertical stabilizer and the tail rotor. The free turbine engine is mounted aft of the main rotor horizontally on top of the fuselage. The landing gear is the shock-absorbing skid type.		LOADING LB L.F.	
Mfr Allison Corp.			Empty 1586	
Engine spec. no. 803-F Amend- ment 1			Empty (with armor)1807.6	
Type Axial-centrifugal compressor, free turbine			Basic 1766.2	3.50
Length 41 in.			Design 3000	2.50
Width 15.5 in.			Combat	
Height 18 in.			Unarmed	
Weight 135 lbs.			mission 2766.6	2.71
Helicopter rotor			Armed mission . . 2973.6	2.52
gear ratio 17.44:1			Max structural . . 3000	2.50
ENGINE RATINGS			FUEL AND OIL	
Standard Sea Level Static Conditions			Fuel:	
SHP RPM DUR			Grade JP- 4	
Takeoff 317 6180 5 min.			Spec MIL-T-5624	
Normal 270 6180 Cont.*			Alternate .. MIL-F-46005 (Type I)	
*Derated for Transmission			Emergency MIL-G-5572	
DIMENSIONS			No. Tanks .. 1	
Rotor dia 35 ft, 4 in.			Location ... Fuselage	
Length:			Qty 73 gal	
Rotors			Oil:	
operating 40 ft, 11.8 in.			Engine	
Blades			Spec MIL-L-7808	
removed 32 ft, 1.9 in.			No. Tanks . 1	
Height:			Location .. Fuselage	
To top of			Transmission	
rotor fairing .. 9 ft, 7.0 in.			Spec MIL-L-23699	
Tread of skids 6 ft, 5.4 in.			Alternate . MIL-L-7808	
Main rotor:			M/R Hub ... 10-W-30	
Disk area 979.8 sq. ft.			Spec MIL-L-2104	
Blade area 38.26 sq. ft.				
Tail rotor:				
Disk area 20.97 sq. ft.				
Blade area 2.26 sq. ft.				
DEVELOPMENT				
First production article		May 1969		
FEATURES	PERSONNEL			
Dual controls	Crew (normal)	1		
Rear seat palletized	Observer	2		
Cargo platform	Copilot	1		
Two bladed seesaw rotor system				
		Refer to chapter 2.		
		ARMAMENT		
		Refer to chapter 2.		

1-44. Loading and Performance - Typical Mission, OH-58A (Kiowa).

CONDITIONS	I BASIC MISSION (Unarmed Observation)	II ALTERNATE (Armed Scout)
TAKEOFF WEIGHT	2760	2967 ^{4/}
Fuel	455	428
Payload	170	298
Takeoff Power Loading	9.15	9.84
Disk Loading	2.82	3.03
Speed for Min. R/D	49	49
Vertical Rate of Climb @ Sea Level ^{1/}		
Max Rate of climb @ Sea Level ^{1/}	1780	1600
Speed for Max R/C @ Sea Level	48	50
Time Sea Level to 5000 ft. ^{1/}	3.5	4.0
Time Sea Level to 10,000 ft. ^{1/}	7.5	8.5
Service Ceiling (100 fpm) ^{2/}	19,000	17,200
Absolute Hover Ceiling ^{1/}	8,000	5,400
COMBAT RANGE	260	230
Average speed	102	120
Cruising Altitude	14,000	10,000
Total Mission Time	2.98	2.47
COMBAT RADIUS	147	121
Average Speed	102	102
Cruising Altitude	14,000	12,200
Total Mission Time	2.98	2.47
COMBAT WEIGHT ^{3/}	2550	2770
Combat Altitude	14,000	10,000
Combat Speed	87	99
Combat Climb ^{1/}	1090	1120
Service Ceiling ^{3/}	21,000	19,500
Absolute Hover Ceiling	10,600	8000
Max R/C @ Sea Level ^{1/}	1750	1600
Speed for Max R/C	48	50
Max Speed @ Sea Level	120	120
Basic Speed @ 5000 ft.	114	114

^{1/} Takeoff power up to 5 minutes.^{2/} Normal Power.^{3/} For Radius Mission.^{4/} Includes XM-27E-1 Armament Kit.

Performance Basis: Bell flight test 206A MOD.

All performance is out of ground effect and for standard atmospheric conditions.

1-45. Performance Notes, OH-58A (Kiowa).

RADIUS MISSION – I II

RANGE MISSION – I II

Warmup – Two minutes at normal power at sea level

Takeoff and Climb – On course at military power to altitude for best range at average cruise weight

Cruise – At speed for best range

Reserve – 10% takeoff fuel

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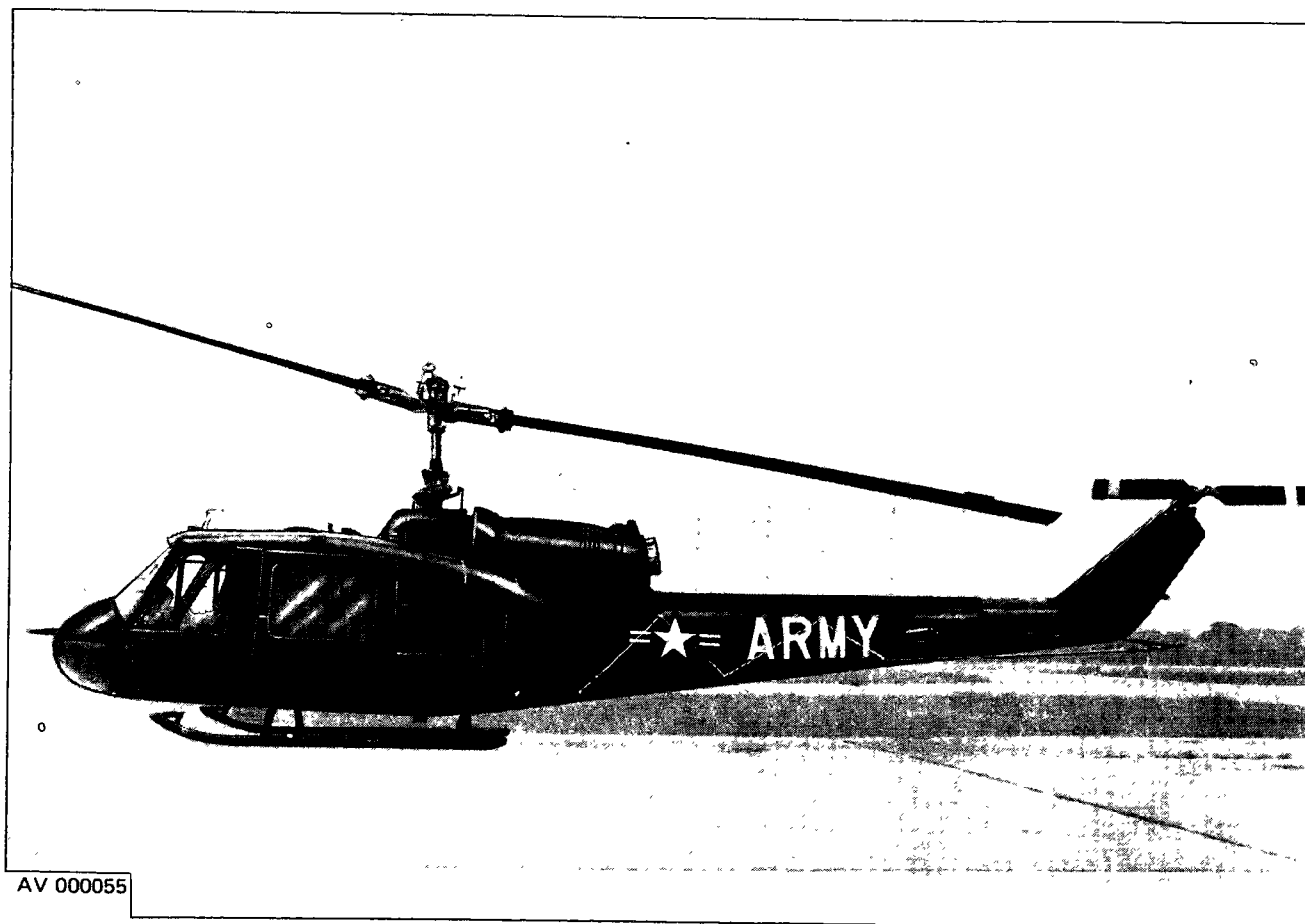
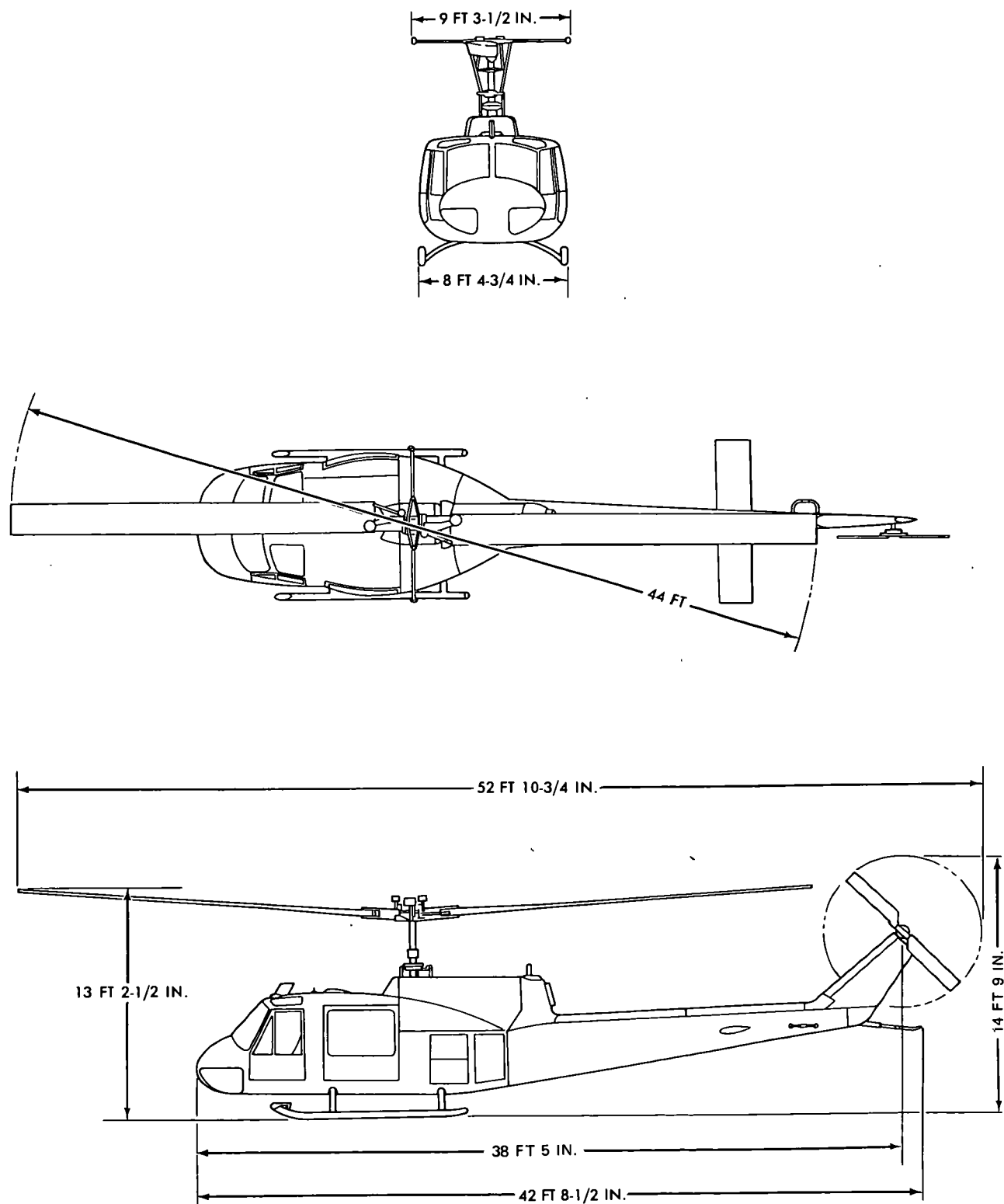


Figure 1-22. UH-1B (Iroquois)



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Figure 1-23. Principal dimensions, UH-1B (Iroquois)

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1-46. UH-1B (Iroquois) Characteristics.

POWERPLANT				MISSION AND DESCRIPTION		WEIGHTS	
No. & model ... (1) T53-L-5/-9/-11				Mfr's Model: Bell 204		LB L.F.	
Mfr Lycoming				The principal missions of the UH-1B are the transport of personnel, special teams or crews, equipment, supplies, and to serve as an aerial weapons platform. Universal pylons are attachable to the aircraft to serve as mounts for weapons or external fuel tanks. It may also be used for medical evacuation and as an instrument trainer. These missions may be performed from prepared or unprepared takeoff and landing areas, under instrument operations including light icing, and day or night flight. The gas-turbine-powered UH-1B is of compact design having a low silhouette. The two-bladed main rotor and the two-bladed tail rotor are of all-metal construction. The fuselage is of semimonocoque construction. Sliding cabin doors allow straight-through loading. Litters may be loaded from either side or both sides simultaneously. The cargo floor is knee-high to facilitate loading. The copilot's controls are removable, thus providing accommodations for a passenger in the copilot's seat or, when the copilot's seat is removed, additional cargo area. Some UH-1B's, have complete provisions for a variable speed, power-driven hoist supported by a swing boom, capable of lifting personnel or cargo while hovering.		Empty	
Type Free power turbine						(calculated)....	4557
Red. gear ratio .. 0.3119						Basic	4825
Tailpipe Fixed area						Design	6600 3.0
Augmentation .. None						Combat	*6596 3.0
					Max takeoff	8500 2.3	
					Max landing	8500	
					*For basic mission.		
ENGINE RATINGS				DEVELOPMENT		FUEL AND OIL	
T53-L-5				Date of contract December 1960		Fuel:	
Rating/SL	SHP	SFC	Output RPM	First flight March 1960		Grade JP-4/5	
Max				First delivery December 1961		Spec MIL-T-5624	
(takeoff)	960	0.694	6607			No. tanks:	
Mil	900	0.702	6607			Fuselage (2) 165 gal	
NRP	825	0.715	6607			Ferry (1) 350 gal	
T53-L-9/11						Total qty 515 gal	
Rating/SL	SHP	SFC	Output RPM			Oil:	
Max						Spec MIL-L-7808	
(takeoff)	1100	0.682	6610			or	
Mil	1000	0.690	6610			MIL-L-23699	
NRP	900	0.702	6610			No. tanks 1	
						Location Fuselage	
						Qty 3-1/4 gal	
DIMENSIONS				CAPACITIES		AVIONICS	
Rotor dia 44 ft				Inside clearance		Refer to chapter 2.	
Length:				Cargo area:			
Rotors				Length (overall).... 4 ft		Basic mission	
operating 53 ft				Width (floor level) .. 6 ft, 8-1/2 in.			
Rotors static ... 53 ft				Height (max)..... 4 ft		Crew (pilot and medical attendant) 2	
Fuselage 42 ft, 8-1/2 in.				Copilot area:		Litters 3	
Span (max				Length (overall).... 4 ft, 7 in.		Transport mission	
lateral) 9 ft, 3-1/2 in.				Width (floor level) .. 2 ft, 7 in.		Crew 1	
Height 14 ft, 8-1/2 in.				Height (max)..... 4 ft		Passengers 4	
Tread 8 ft, 4-3/4 in.				Main cargo door		Alternate	
Rotor gnd clearance:				Height (max)..... 4 ft		Crew 1	
(static) 7 ft, 4-3/4 in.				Width (max)..... 4 ft		Passengers 7	
				Limit floor loads (overall)		Trainer	
				Cargo area 300 lb/sq ft		Crew (instructor & student) 2	
				Copilot area 75 lb/sq ft		Ferry	
				Usable cubage		Crew 1	
				Cargo area 140 cu ft			
				Copilot area 20 cu ft			

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1-47. Loading and Performance - Typical Missions, UH-1B (Iroquois).

CONDITIONS	TRANSPORT (CARGO OR PASSENGER)	ARMED ^{12/}	INSTRUMENT TRAINER	FERRY
TAKEOFF WEIGHT (lb) ...	6762	6605	6088 ^{5/}	8390 ^{6/}
Fuel at 6.5 lb/gal (grade JP-4) (lb) ...	1073	1073	1073 ^{7/}	3348 ^{7/}
Payload (outbound) (lb) ...	800	0	0	0
Payload (inbound) (lb) ...	0	90	0	0
Takeoff power loading ^{8/} (lb/bhp) ...	7.04	6.86	6.34	8.74
Disk loading (lb/sq ft) ...	4.45	4.35	4.00	5.52
Autorotation speed (min R/D) (kn) ...	57.0	56.5	55.6	60.1
Takeoff ground run at SL ^{1/} (ft) ...	0	0	0	0
Takeoff to clear 50 ft ^{1/} (ft) ...	0	0	0	0
Vertical rate of climb at SL ^{1/} (fpm) ...	1610	1780	2330	....
Maximum rate of climb at SL ^{2/} (fpm) ...	1910	2010	2300	1250
Speed for max R/C at SL (kn) ...	57.0	56.5	55.6	60.1
Time: SL to 5000 ft ^{2/} (min) ...	2.7	2.5	2.3	4.6
Time: SL to 10,000 ft ^{2/} (min) ...	6.0	5.4	4.9	 ^{11/}
Service ceiling (100 fpm) ^{2/} (ft) ...	18,000	17,000	20,200	8800
Absolute hovering ceiling ^{1/} (ft) ...	11,500	12,400	14,900	....
COMBAT RANGE ^{10/} (nmi) ...	230	210	218	695
Average cruise speed (kn) ...	106	90	106	103.4
Initial cruising altitude (ft) ...	10,000	10,000	10,000	5000
Final cruising altitude (ft) ...	10,000	10,000	10,000	10,000
Total mission time (hr) ...	2.25	2.45	2.12	6.88
COMBAT RADIUS ^{10/} (nmi) ...	112.7	94.5	98.8	....
Average cruise speed (kn) ...	106	90	106	....
Cruising altitude (outbound) (ft) ...	10,000	10,000	10,000	....
Cruising altitude (inbound) (ft) ...	10,000	10,000	10,000	....
Total mission time (hr) ...	2.22	2.4	1.95	....
FIRST LANDING WEIGHT ^{3/} (lb) ...	6253	6145	5631	....
Ground roll at SL (ft) ...	0	0	0	....
Total from 50 ft (ft) ...	0	0	0	....
COMBAT WEIGHT ^{3/} (lb) ...	5453	7241	5631	5377
Combat altitude (ft) ...	10,000	5000	10,000	10,000
Combat speed (kn) ...	106	100	106	106
Combat climb ^{2/} (fpm) ...	2190	1590	2050	2220
Combat ceiling (500 ft/min) ^{2/, 12/} (ft) ...	22,400	15,400	21,400	22,600

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1-47. Loading and Performance - Typical Missions, UH-1B (Iroquois) (CONT).

CONDITIONS	TRANSPORT (CARGO OR PASSENGER)	ARMED ^{12/}	INSTRUMENT TRAINER	FERRY
Service ceiling (100 ft/min) ^{2/, 12/} (ft) ...	23,100	16,000	22,200	23,250
Absolute hovering ceiling ^{1/, 12/} (ft) ...	18,200	9000	16,800	18,500
Takeoff ground run at SL ^{1/} (ft) ...	0	0	0	0
Takeoff to clear 50 ft ^{1/} (ft) ...	0	0	0	0
Maximum rate of climb at SL ^{2/} (fpm) ...	2740	1740	2620	2810
Speed for max R/C at SL (kn) ...	54.2	58.0	54.6	54.1
Max speed at SL ^{4/} (kn) ...	120	105	120	120
Basic speed at 5000 ft ^{4/} (kn) ...	117.5	100	117.5	117.5
LANDING WEIGHT ^{3/} (lb) ...	4996	5639	5188	5377
Ground roll at SL (ft) ...	0	0	0	0
Total from 50 ft (ft) ...	0	0	0	0

^{1/} Takeoff power.^{2/} Normal rated power.^{3/} For RADIUS mission if radius is shown.^{4/} V_{ne} limit.^{5/} Includes crew of 2 at 400 lb.^{6/} Includes crew of 1 at 200 lb.^{7/} Includes 1 x 350 gallon tank.^{8/} Based on engine specification takeoff shaft horsepower available.^{9/} Three 250-lb litter patients.^{10/} Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-48.^{11/} Above service ceiling.^{12/} Armed W/M-16 subsystem.

Performance Basis:

- Power required based on FTC-TDR-62-21, "YUH-1B Category II Performance Tests."
- Power available and fuel flow are based on Lycoming Model Specification No. 104. 16-B.
- All data are at 6600 engine rpm.
- Except for Ferry Mission, data do not include ground effect.

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1-48. Performance Notes, UH-1B (Iroquois).**FORMULA: RADIUS MISSION I**

Warm up, take off, climb on course to 10,000 feet at normal power, proceed at cruise speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 5000 feet at normal power, and return at cruise speeds. Range-free allowances are 4 minutes of normal power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Warm up, take off, climb on course to 10,000 feet at normal power, proceed at cruise speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 10,000 feet at normal power, and return at cruise speeds. Range-free allowances are 4 minutes of normal power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, climb on course to 10,000 feet at normal power, proceed at cruise speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 10,000 feet at normal power, and return at cruise speed. Range-free allowances are 10 minutes of normal power for warmups and takeoffs plus 20 minutes at speeds for maximum endurance at sea level, plus 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSION II

Warm up, take off, climb on course to 10,000 feet at normal power, and proceed at cruise speeds until 90 percent of initial fuel is consumed. Range-free allowances are 2 minutes of normal power for warmup and takeoff plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, climb on course to 5000 feet initial altitude at normal power, proceed at cruise speeds to remote base, and land. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus 20 minutes at speeds for maximum endurance at sea level, plus 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSION IV

Warm up, take off, climb on course to 5000 feet initial altitude at normal power, maintain 30 feet per minute rate of climb to final altitude of 10,000 feet, and proceed at cruise speeds until 90 percent of initial fuel is consumed. Range-free allowances are 2 minutes of normal power for warmup and takeoff plus 10 percent of initial fuel for reserve.

GENERAL NOTES

a. Cruise speed as used above denotes airspeed for long-operation or maximum permissible speed, whichever is lower.

b. Except for ferry mission takeoff, data do not include ground effect.

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Figure 1-24. UH-1C and M (Iroquois)

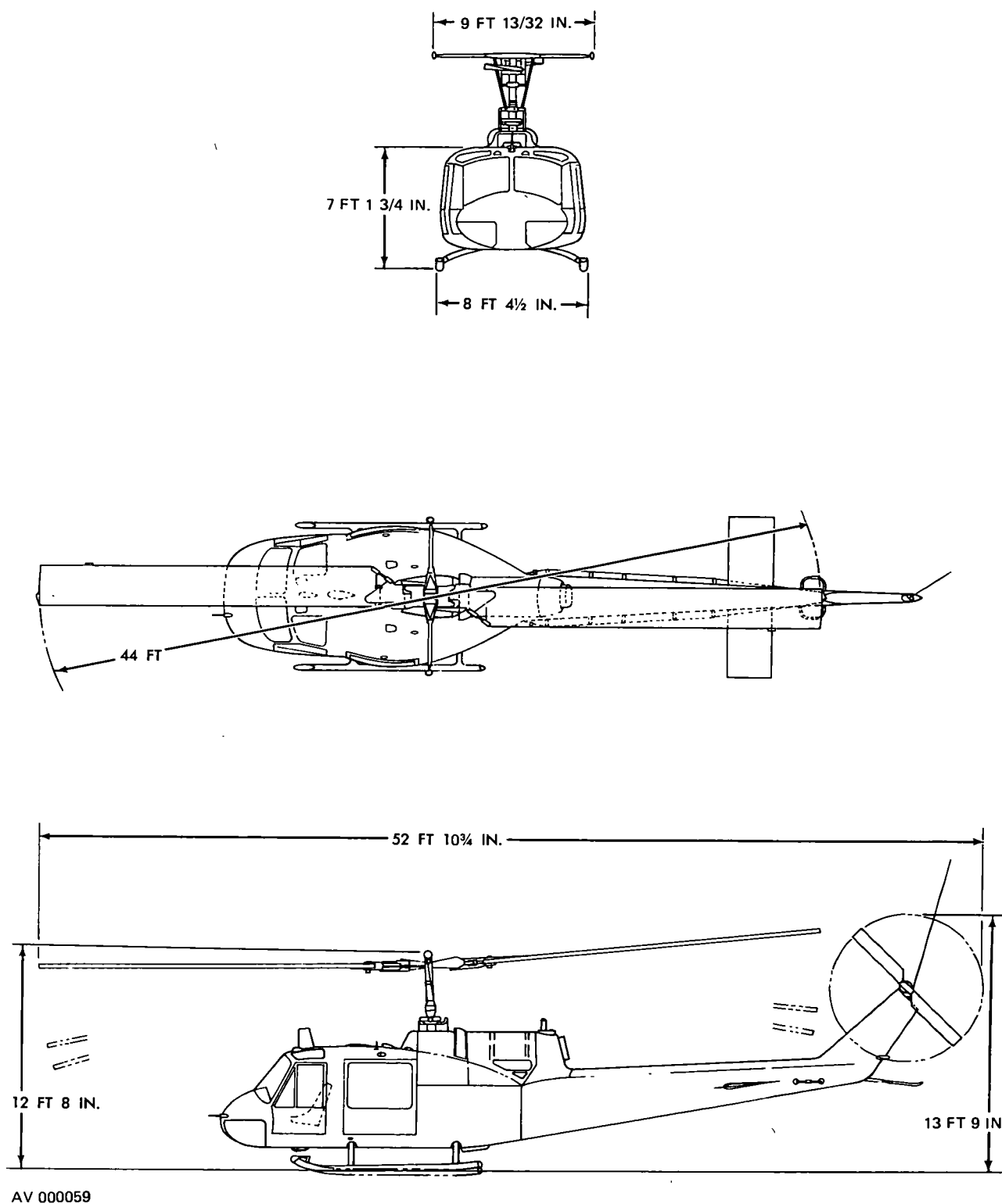


Figure 1-25. Principal dimensions, UH-1C and M (Iroquois)

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1-49. UH-1C/M* (Iroquois) Characteristics.

POWERPLANT				MISSION AND DESCRIPTION		WEIGHTS	
No. & model (1) T53-L-9/-9A/-11/-11B				Mfr's Model: Bell		Empty	LB L.F.
Mfr Lycoming				The principal missions of the UH-1C helicopter are transporting personnel, special teams or crews, equipment and supplies; medical evacuation; ambulance service; reconnaissance and security; point target and area fire by attachment of appropriate weapons; and instrument trainer. These missions may be performed from prepared or unprepared takeoff and landing areas, under instrument operations including light icing, and day or night flight. Navigation may be by dead reckoning or by use of radio aids.		Gross	9500
Engine spec No . . . 104.22-B & .28							
Type Free power turbine							
Red. gear ratio 0.3119							
Tailpipe Fixed area							
Augmentation None				The main difference between the UH-1C and UH-1B is the main rotor system. The UH-1C has the 540 rotor system which has a flexure plate, hinge-half type hub and a wider cord blade. The 540 rotor system provides a more stable gun platform, higher maximum gross weight, and higher forward speed. Some UH-1C's have complete provisions for a variable speed, power driven hoist supported by a swing boom, capable of lifting personnel or cargo while hovering.		FUEL AND OIL	
ENGINE RATINGS							
T53-L-9/11							
Rating/SL	SHP	SFC	Output RPM			Fuel:	
Max (takeoff)	1100	0.682	6610			Grade	JP-4/5
Mil	1000	0.690	6610	Spec	MIL-T-5624		
NRP	900	0.702	6610	Qty	242 gal		
						Oil:	
						Spec	MIL-L-7808 or MIL-L-23699
						Qty-Engine	4 gal
						Qty-Transmission and gear boxes	2.8 gal
DIMENSIONS				DEVELOPMENT		AVIONICS	
Rotor dia 44 ft				Contracting agency AVSCOM		Refer to chapter 2.	
Length:				Delivery schedule June 1965 thru November 1967		ARMAMENT	
Rotors				CAPACITIES		Refer to chapter 2.	
operating 53 ft				PERSONNEL		FEATURES	
Rotors static 53 ft				Basic mission		All metal, semi-rigid rotor, skid-type landing gear.	
Fuselage 42 ft, 8 in.				Crew (pilot and medical attendant) 2			
Span (max lateral) 9 ft, 1/2 in.				Litters 3			
Height 14 ft, 9 in.				Transport mission			
Tread 8 ft, 4-1/2 in.				Crew 1			
Rotor gnd clearance: (static) 7 ft, 4-1/2 in.				Passengers 4			
				Alternate			
				Crew 1			
				Passengers 7			
				Trainer			
				Crew (instructor & student) 2			
				Ferry			
				Crew 1			

*UH-1M incorporates the T53-L-13 engine.

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1-50. Performance - Typical Mission, UH-1C (Iroquois).

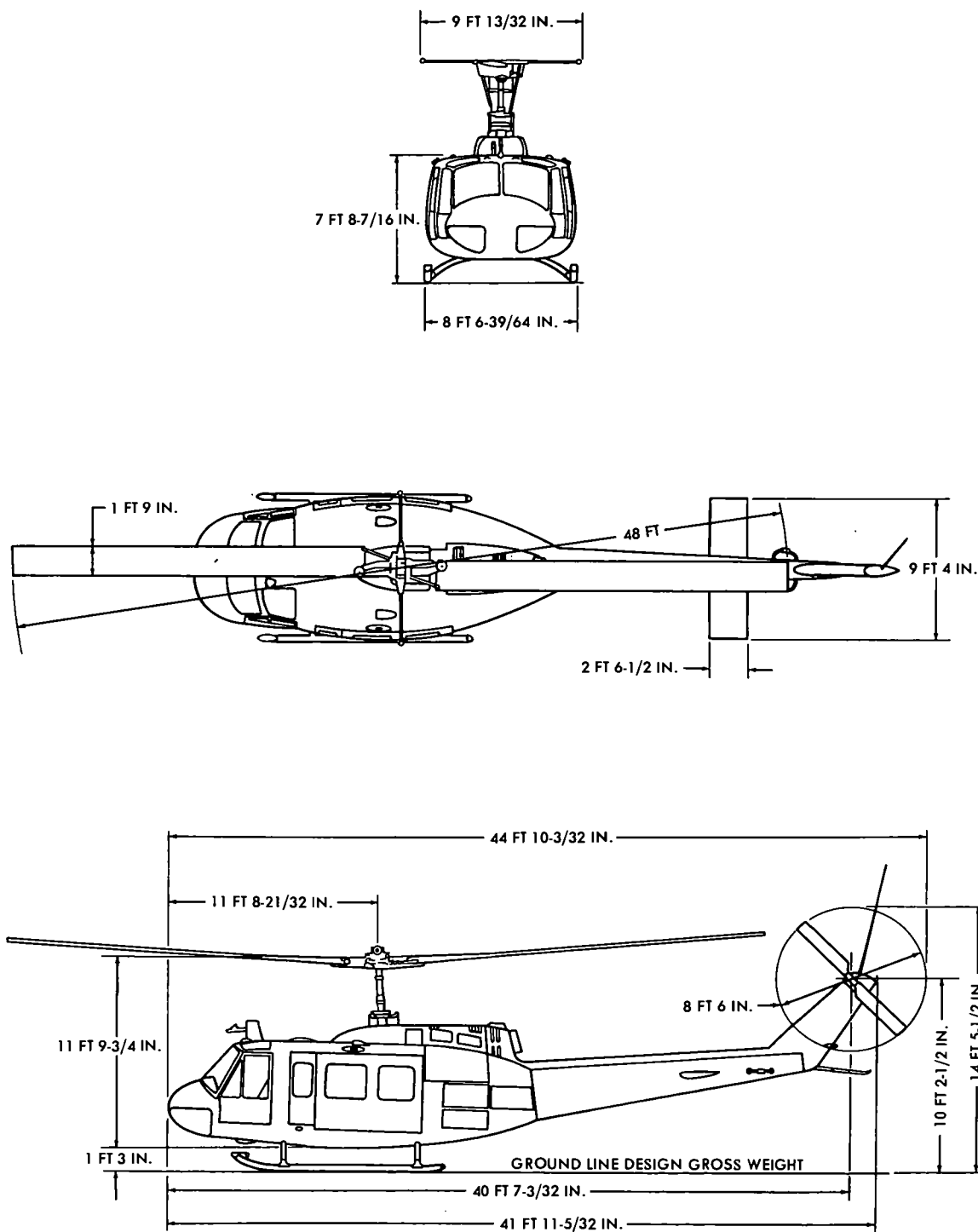
Takeoff distance	(ft)	0
Rate of climb	(fpm)	2,420
Service ceiling	(ft)	21,100
Cruise speed ^{1/}	(kn)	92-110
Max, speed	(kn)	140
Range	(nmi)	300
Landing distance	(ft)	0

^{1/}Normal rated power (6600 rpm) at sea level.

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Figure 1-26. UH-1D and H (Iroquois)



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Figure 1-27. Principal dimensions, UH-1D and H (Iroquois)

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1-51. UH-1D (Iroquois) Characteristics.

POWERPLANT				MISSION AND DESCRIPTION		WEIGHTS	
No. & model ... (1) T53-L-9/-9A/-11/-11B				Mfr's Model: Bell 205 The missions of the UH-1D include transportation of personnel, equipment and supplies, medical evacuation, delivery of protective fire by attachment of appropriate weapons, and instrument training. These missions may be performed from prepared or unprepared takeoff and landing areas, under instrument operations including light icing, and day or night flight. The UH-1D is of compact design having a low silhouette. The semimonocoque fuselage is of all-metal construction as are the tail rotor blades and the two main rotor blades. The sliding doors along each side of the cabin allow simplified straight-through loading from either side or both sides simultaneously. This capability is especially useful while loading or unloading litter patients. The knee-high cargo floor also contributes to loading ease. Since the copilot's controls are removable, an extra passenger can be carried. If the copilot's seat is also removed, an extra 8.75 square feet of cargo area is gained. Some UH-1D's have complete provisions for a variable speed, power-driven hoist supported by a swing boom, capable of lifting personnel or cargo while hovering. Retrofit of a crashworthy fuel system with closed circuit refueling capability is being accomplished on the UH-1D aircraft.		LB	L.F.
Mfr Lycoming						Empty (calculated) 5098	
Engine spec No.. 104.28 & .22-B						Design 6600	3.0
Type Free power turbine						Combat 9500	2.2
Red. gear ratio .. 0.312						Max takeoff 9500	2.2
Tailpipe Fixed area						Max landing 9500	
Augmentation .. None							
ENGINE RATINGS						FUEL AND OIL	
T53-L-9/11						Fuel:	
Rating	SHP	SFC	Output RPM			Grade	JP-4/5
Max (takeoff)	1100	0.682	6610			Spec	MIL-T-5624
Mil	1000	0.690	6610			No. tanks:	
NRP	900	0.702	6610			Fuselage	(2) 209 gal
						Ferry	(1) 300 gal
						Total qty	509 gal
DIMENSIONS				CAPACITIES	PERSONNEL	Oil:	
Rotor dia 48 ft				Inside clearance	Basic mission	Spec	
Length:				Cargo area:	Crew	MIL-L-7808	
Rotors				Length (overall) .. 7 ft, 8 in.	Passengers	or	
operating 57 ft, 1 in.				Width (floor level)	Alternate	MIL-L-23699	
Rotors static .. 57 ft, 1 in.				Height (max) 4 ft, 1 in.	Crew	No. tanks	
Fuselage 41 ft, 11-1/4 in.				Copilot area:	Passengers	Location	
Span (max lateral)				Length (overall) .. 3 ft, 7 in.	Litter evacuation	Qty	
Height				Width	Crew (pilot & medical attendant)	AVIONICS	
Tread				Height (max) 4 ft	Litters	Refer to chapter 2.	
Gnd clearance (static, against stops)				Main cargo door	Cargo	ARMAMENT	
				Height	Crew	Refer to chapter 2.	
				Width (max) 6 ft, 2-1/2 in.	Ferry mission		
				Height above ground	Crew (pilot & copilot)		
				Limit floor loads			
				Cargo area			
				Copilot area			
				Usable cubage			
				Capacity			
				Cargo area			
				Copilot area			

1-52. Loading and Performance - Typical Missions, UH-1D (Iroquois).

CONDITIONS	BASIC (PERSONNEL CARRIER)	TRANSPORT (CARGO OR TROOP)	LITTER EVACUATION	FERRY
TAKEOFF WEIGHT (lb) ...	7334 ^{6/}	8954 ^{6/}	6930 ^{5/}	8795 ^{5/}
Fuel at 6.5 lb/gal (grade JP-4) (lb) ...	1359	1359	1359	3309 ^{7/}
Payload (outbound) (lb) ...	800	2420	0	0
Payload (inbound) (lb) ...	0	0	1500 ^{9/}	0
Takeoff power loading ^{8/} (lb/SHP)	6.66	8.14	6.30	7.99
Disk loading (lb/sq ft) ...	4.05	4.95	3.83	4.86
Autorotation speed (min R/D) (kn) ...	51.7	55.5	50.9	55.1
Takeoff ground run at SL (6600 rpm) ^{1/} (ft) ...	0	0	0	0
Takeoff to clear 50 ft (6600 rpm) ^{1/} (ft) ...	0	0	0	0
Vertical rate of climb at SL (6600 rpm) ^{1/} (fpm) ...	1620	420	1960	580
Maximum rate of climb at SL ^{2/} (fpm) ...	1730	1220	1880	1260
Speed for max R/C at SL (kn) ...	51.7	55.5	50.9	55.1
Time: SL to 5000 ft ^{2/} (min) ...	2.9	4.1	2.6	4
Time: SL to 10,000 ft ^{2/} (min) ...	6.2	9.8	5.6	9.3
Service ceiling (100 fpm) ^{2/} (ft) ...	20,900	14,900	22,400	15,200
Absolute hovering ceiling (6600 rpm) ^{1/} (ft) ...	10,100	2300	12,200	3000
COMBAT RANGE ^{10/} (nmi) ...	305.4	259	....	705.0
Average cruise speed (kn) ...	102	99	....	103
Cruising altitude (initial) (ft) ...	10,000	7800	....	8700
Cruising altitude (final) (ft) ...	10,000	10,000	....	10,000
Total mission time (hr) ...	2.99	2.62	....	6.87
COMBAT RADIUS ^{10/} (nmi) ...	149	134	143.3	....
Average cruise speed (kn) ...	105.4	103.5	103.5	....
Cruising altitude (outbound) (min/max) (ft) ...	10,000/10,000	8100/10,000	10,000	....
Cruising altitude (inbound) (ft) ...	10,000	10,000	5000	....
Total mission time (hr) ...	2.92	2.7	2.34	....
FIRST LANDING WEIGHT ^{3/} (lb) ...	6655	8220	6320	....
Ground roll at SL (6600 rpm) (ft) ...	0	0	0	....
Total from 50 ft (6600 rpm) (ft) ...	0	0	0	....
COMBAT WEIGHT ^{3/} (lb) ...	5855	5800	7800	5753
Combat altitude (ft) ...	10,000	10,000	5000	10,000
Combat speed ^{4/} (kn) ...	110	110	118	110
Combat climb ^{2/} (fpm) ...	2020	2040	1520	2070
Combat ceiling (500 ft/min) ^{2/} (ft) ...	25,000	25,200	16,200	25,400
Service ceiling (100 ft/min) ^{2/} (ft) ...	26,900	27,000	18,900	27,200
Absolute hovering ceiling (6600 rpm) ^{1/} (ft) ...	17,600	17,800	7600	18,100
Takeoff ground run at SL (6600 rpm) ^{1/} (ft) ...	0	0	0	0

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1-52. Loading and Performance - Typical Missions, UH-1D (Iroquois) (CONT).

CONDITIONS	BASIC (PERSONNEL CARRIER)	TRANSPORT (CARGO OR TROOP)	LITTER EVACUATION	FERRY
Takeoff to clear 50 ft (6600 rpm) ^{1/} (ft) ...	0	0	0	0
Maximum rate of climb at SL ^{2/} (fpm) ...	2360	2400	1560	2420
Speed for max R/C at SL (kn) ...	48.8	48.7	52.8	48.6
Max speed at SL ^{4/} (kn) ...	120	120	117.5	120
Basic speed at 5000 ft ^{4/} (kn) ...	119	119	118	119
LANDING WEIGHT ^{3/} (lb) ...	5247	5247	7143	5753
Ground roll at SL (6600 rpm) (ft) ...	0	0	0	0
Total from 50 ft (6600 rpm) (ft) ...	0	0	0	0

^{1/} Takeoff power.^{2/} Normal rated power.^{3/} For RADIUS mission if radius is shown.^{4/} V_{ne} limit.^{5/} Includes crew of 2 at 400 lb.^{6/} Includes crew of 1 at 200 lb.^{7/} Includes two 150-gallon ferry tanks.^{8/} Based on engine specification takeoff shaft horsepower.^{9/} Six 250-pound litter patients.^{10/} Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-53.

Performance Basis:

- Power required based on Bell Model 204B FAA Flight Test.
- Power available and fuel flow based on Lycoming Model Specification No. 104.28.
- All data are at 6400 rpm unless otherwise noted.

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1-53. Performance Notes, UH-1D (Iroquois).**FORMULA: RADIUS MISSION I**

Warm up, take off, climb on course to 10,000 feet initial altitude at normal rated power, proceed at long range cruise speed to remote base, land, and unload passengers. Without refueling, warm up, take off, climb on course to 10,000 feet at normal rated power, and return at long range cruise speed. Range-free allowances are 4 minutes at normal rated power for warm-ups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Warm up, take off, and climb on course to 8100 feet at normal rated power. Cruise climb on course at long range cruise speed to final altitude of 10,000 feet. Proceed at long range speed to remote base, land, and unload cargo or troops. Without refueling, warm up, take off, climb on course to 10,000 feet at normal rated power, and return at long range cruise speed. Range-free allowances are 4 minutes at normal rated power for warmups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, and climb on course to 10,000 feet at normal rated power. Proceed at long range cruise speed to remote base, land, and pick up litter patients. Without refueling, warm up, take off, climb

on course to 5000 feet at normal rated power, and return at long range cruise speed. Range-free allowances are 4 minutes at normal rated power for warm-ups and takeoffs plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION I

Warm up, take off, and climb on course to 10,000 feet initial altitude at normal rated power. Proceed at long range cruise speed to remote base and land. Range-free allowances are 2 minutes at normal rated power for warmup and takeoff plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION II

Warm up, take off, and climb on course to 7800 feet at normal rated power. Cruise climb on course at long range cruise speed to final altitude of 10,000 feet. Proceed at long range cruise speed to remote base and land. Range-free allowances are 2 minutes at normal rated power for warmup and takeoff plus 10 percent of initial fuel for reserve.

FORMULA: RANGE MISSION IV

Warm up, take off, and climb on course to 8700 feet at normal power. Cruise climb on course at long range cruise speed to final altitude of 10,000 feet. Proceed at long range cruise speed to remote base and land. Range-free allowances are 2 minutes at normal rated power for warmup and takeoff plus 10 percent of initial fuel for reserve.

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POWERPLANT				MISSION AND DESCRIPTION		WEIGHTS	
No. & model (1) T53-L-13 Mfr Lycoming Type 104.33 Red. gear ratio ... 0.312 Tailpipe Fixed area Augmentation ... None				Mfr's Model: Bell 205 The UH-1H is a modified UH-1D with the T53-L-13 turbine engine. The basic description and mission are the same for both aircraft. The advantages over the UH-1D are takeoff distance, rate of climb, range, endurance, and overall mission capabilities. All future production of the UH-1D will be the UH-1H model. Some UH-1H's have complete provisions for a variable speed, power-driven hoist supported by a swing boom, capable of lifting personnel or cargo while hovering. Production and retrofit of a crashworthy fuel system with closed circuit refueling capability is being accomplished on the UH-1D/H aircraft.		Empty 5132 Design 6600 3.0 Combat 9500 2.2 Max takeoff 9500 2.2 Max landing 9500	
ENGINE RATINGS							
T53-L-13							
Rating/SL	SHP	SFC	Output RPM				
Mil	1400*	0.580	6300				
NRP	1250*	0.598	6040				
* 1400 SHP flat rated to 1100 SHP.							
DIMENSIONS				CAPACITIES		FUEL AND OIL	
Rotor dia 48 ft Length: Rotors operating 57 ft, 1 in. Rotors static .. 57 ft, 1 in. Fuselage 41 ft, 11-1/4 in. Span (max lateral) 9 ft, 4 in. Height 14 ft, 5-1/2 in. Tread 8 ft, 6-1/2 in. Gnd clearance (static, against stops) 6 ft, 6 in.				Inside clearance Cargo area: Length (overall) .. 7 ft, 8 in. Width (floor level) 8 ft Height (max) 4 ft, 1 in. Copilot area: Length (overall) .. 3 ft, 7 in. Width 2 ft, 7 in. Height (max) 4 ft Main cargo door Height (max) 4 ft Width (max) 6 ft, 2-1/2 in. Height above ground 2 ft Limit floor loads Cargo area 300 lb/sq ft Copilot area 75 lb/sq ft Usable cubage Capacity: Cargo area 220 cu ft Copilot area 20 cu ft		PERSONNEL Basic mission Crew 1 Passengers 4 Alternate Crew 1 Passengers 12 Litter evacuation Crew (pilot & medical attendant) 2 Litters 6 Cargo Crew 1 Ferry mission Crew (pilot & copilot) 2	
						Fuel: Grade JP-4/5 Spec MIL-T-5624 No. tanks: Fuselage (2) 209 gal Ferry (1) 300 gal Total qty 509 gal Oil: Spec MIL-L-23699 or MIL-L-7808 No. tanks 1 Location Fuselage Qty 4-1/2 gal	
						AVIONICS Refer to chapter 2.	
						ARMAMENT Refer to chapter 2.	

1-55. Loading and Performance - Typical Missions, UH-1H (Iroquois).

CONDITIONS	BASIC (PERSONNEL CARRIER)	TRANSPORT (CARGO OR TROOP)	LITTER EVACUATION	FERRY
TAKEOFF WEIGHT (lb)	7644 <u>6/</u>	9264 <u>6/</u>	7414 <u>5/</u>	9305 <u>5/</u>
Fuel at 6.5 lb/gal (grade JP-4) (lb)	1370	1370	1370	3320 <u>7/</u>
Payload (outbound) (lb)	800	2420	0	0
Payload (inbound) (lb)	0	0	1500 <u>9/</u>	0
Takeoff power loading <u>8/</u> (lb/SHP)	6.94	8.42	6.74	8.45
Disk loading (lb/sq ft)	4.22	5.11	4.10	5.14
Autorotation speed (min R/D) (kn)	61	65	60	65
Takeoff ground run at SL (6600 rpm) <u>1/</u> (ft)	0	0	0	0
Takeoff to clear 50 ft (6600 rpm) <u>1/</u> (ft)	0	0	0	0
Vertical rate of climb at SL (6600 rpm) <u>1/</u> (fpm)	1620	420	1960	580
Maximum rate of climb at SL <u>2/</u> (fpm)	1653	1126	1691	1112
Speed for max R/C at SL (kn)	61	65	60	65
Time: SL to 5000 ft <u>2/</u> (min)	3.1	4.6	2.9	4.1
Time: SL to 10,000 ft <u>2</u> (min)	6.2	9.9	5.9	10.2
Service ceiling (100 fpm) <u>2/</u> (ft)	18,340	13,960	19,140	13,640
Absolute hovering ceiling (6600 rpm) <u>1/</u> (ft)	14,800	4000	16,000	3600
COMBAT RANGE <u>10/</u> (nmi)	275	250	....	676
Average cruise speed (kn)	111	105	....	110
Cruising altitude (initial) (ft)	10,000	7800	....	8700
Cruising altitude (final) (ft)	10,000	10,000	....	10,000
Total mission time (hr)	2.46	2.37		6.13
COMBAT RADIUS <u>10/</u> (nmi)	141	124	133	
Average cruise speed (kn)	111	107	121	

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1-55. Loading and Performance - Typical Missions, UH-1H (Iroquois) (CONT).

CONDITIONS	BASIC (PERSONNEL CARRIER)	TRANSPORT (CARGO OR TROOP)	LITTER EVACUATION	FERRY
Cruising altitude (outbound) (min/max) (ft)	10,000/10,000	8100/10,000	10,000	.....
Cruising altitude (inbound) (ft)	10,000	10,000	5000	.....
Total mission time (hr)	2.73	2.54	2.38	.....
FIRST LANDING WEIGHT ^{3/} (lb)	6997	8584	6789	.....
Ground roll at SL (6600 rpm) (ft)	0	0	0	.....
Total from 50 ft (6600 rpm) (ft)	0	0	0	.....
COMBAT WEIGHT ^{3/} (lb)	6197	6164	8289	6316
Combat altitude (ft)	10,000	10,000	5000	10,000
Combat speed ^{4/} (kn)	116	116	120	116
Combat climb ^{2/} (fpm)	2256	2276	1370	2200
Combat ceiling (500 ft/min) ^{2/} (ft)	23,550	23,694	15,960	23,150
Service ceiling (100 ft/min) ^{2/} (ft)	24,070	24,210	16,842	23,680
Absolute hovering ceiling (6600 rpm) ^{1/} (ft)	21,300	21,400	11,600	20,700
Takeoff ground run at SL (6600 rpm) ^{1/} (ft)	0	0	0	0
Takeoff to clear 50 ft (6600 rpm) ^{1/} (ft)	0	0	0	0
Maximum rate of climb at SL ^{2/} (fpm)	2232	2251	1399	2178
Spec 1 for max R/C at SL (kn)	55.9	55.8	62.0	56.1
Max speed at SL ^{4/} (kn)	120	120	120	120
Basic speed at 5000 ft ^{4/} (kn)	120	120	120	120
LANDING WEIGHT ^{3/} (lb)	6977	8584	6789	6316
Ground roll at SL (6600 rpm) (ft)	0	0	0	0
Total from 50 ft (6600 rpm) (ft)	0	0	0	0

1-55. Loading and Performance - Typical Missions, UH-1H (Iroquois) (CONT).

- 1/ Takeoff power.
- 2/ Normal rated power.
- 3/ For RADIUS mission if radius is shown.
- 4/ V_{ne} limit.
- 5/ Includes crew of 2 at 400 lb.
- 6/ Includes crew of 1 at 200 lb.
- 7/ Includes two 150-gallon ferry tanks.
- 8/ Based on engine specification takeoff shaft horsepower.
- 9/ Six 250-pound litter patients.
- 10/ Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-52.

Performance Basis:

- a. Reference operator's Manual Army Model UH-1D H Helicopter TM 55-1520-210-10.
- b. All data are at 6600 rpm unless otherwise noted.

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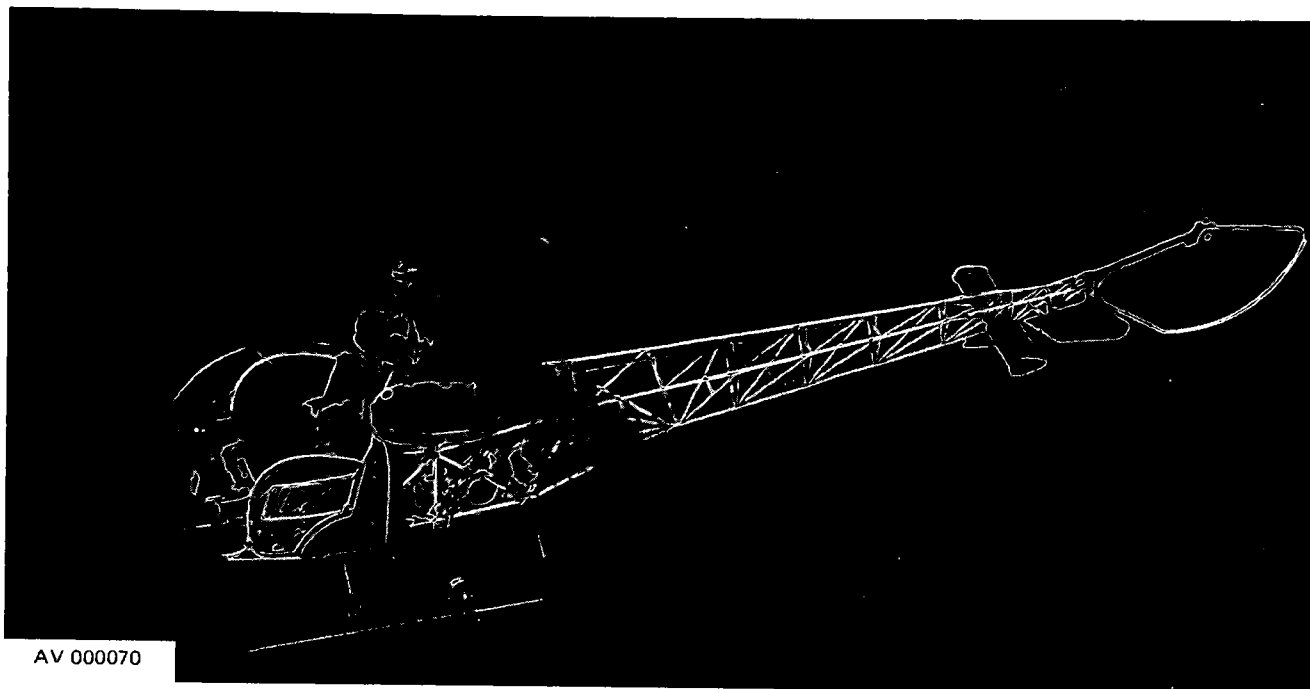
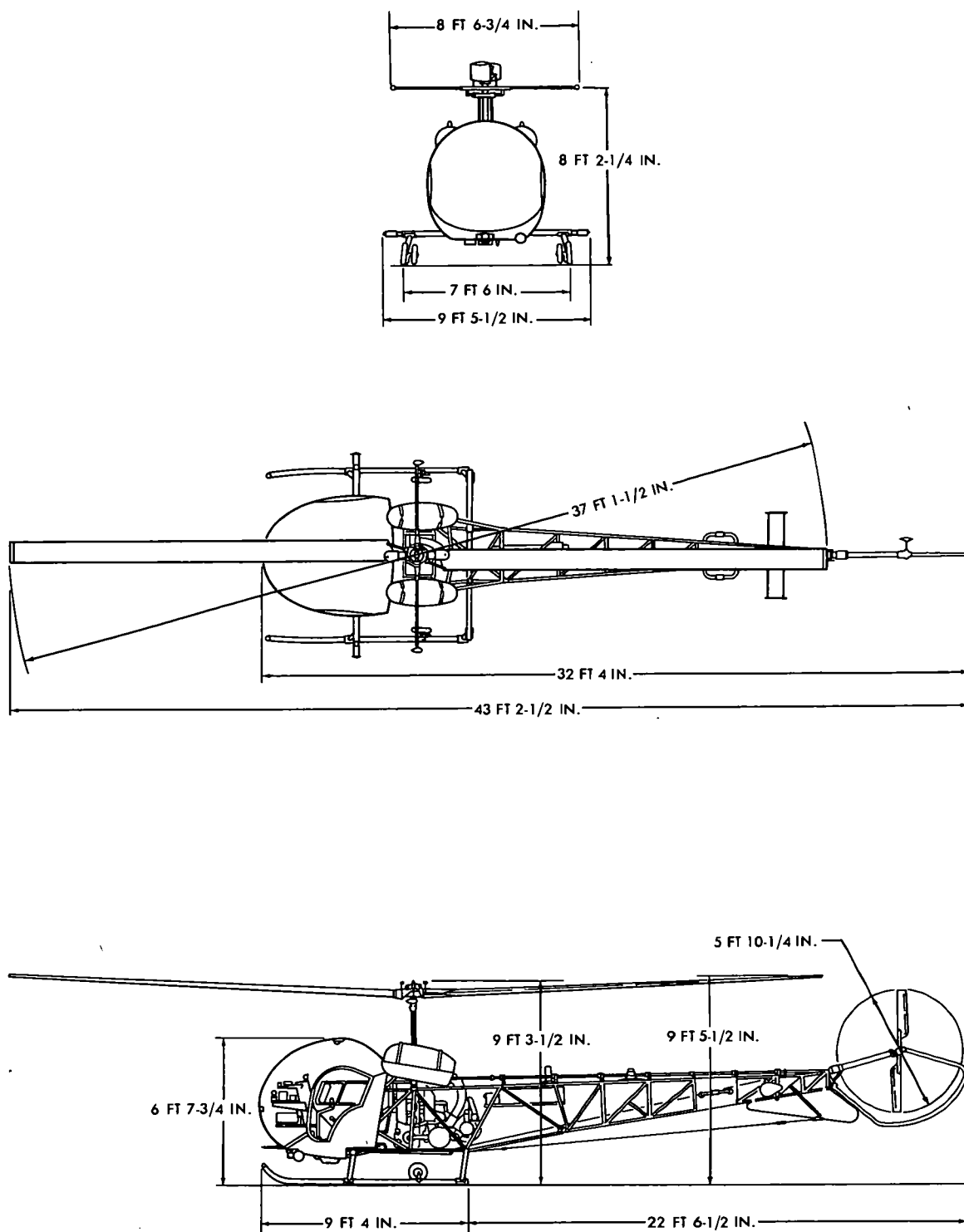


Figure 1-28. TH-13T (Sioux)



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Figure 1-29. Principal dimensions, TH-13T (Sioux)

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1-56. TH-13T (Sioux) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model . . . (1) O-435-25A Mfr Lycoming Engine spec No . 2309A Red. gear ratio . D.D.	Mfr's Model: Bell 47G3-B1 The principal mission of the TH-13T is primary instrument training. The TH-13T incorporates a 2-blade main rotor and a 2-blade tail rotor with a hydraulically boosted cyclic and collective control system. The fuselage is an open-tube configuration with a bubble-type cockpit enclosure. The landing gear is of the skid-type, with ground handling wheels attached. Dual controls are installed.		LB	L.F.
			Empty (actual) . . . 2060 Design 2950	2.5
ENGINE RATINGS	DEVELOPMENT		FUEL AND OIL	
BHP RPM ALT MIN Takeoff 270 3200 SL 5 Normal 220 3200 SL Cont.	Contract awarded June 1964 First acft delivered December 1964 Last production acft December 1968		Fuel: Grade 100/130 Spec MIL-G-5572 No. tanks 2 Location Fuselage Qty 57 gal Oil: Spec MIL-L-22851 No. tanks 1 Location Engine section Qty 3-1/2 gal	
DIMENSIONS			AVIONICS	
Rotor dia 37 ft, 1-1/2 in. Length: Rotors operating 43 ft, 2-1/2 in. Rotors static . . 43 ft, 2-1/2 in. Fuselage 32 ft, 4 in. Span (max lateral) 8 ft, 6-3/4 in. Height 9 ft, 3-1/2 in. Tread 7 ft, 6 in. Rotor gnd clearance (static) 8 ft, 8-1/2 in. (idling) 8 ft, 8-1/2 in.	FEATURES	PERSONNEL	Refer to chapter 2.	
	Dual controls.	Crew (normal) 1 Passenger/student 1	ARMAMENT	
			None.	

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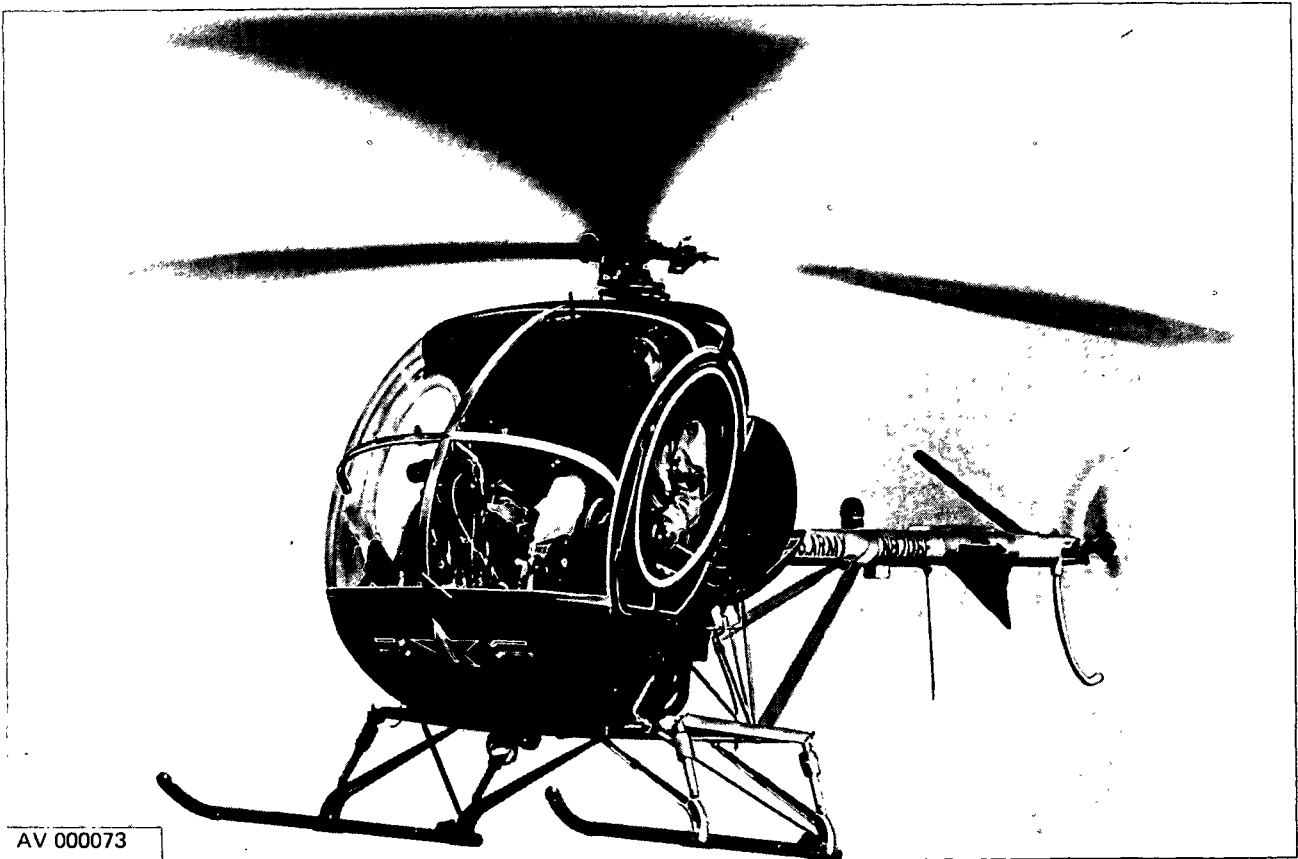


Figure 1-30. TH-55A (Osage)

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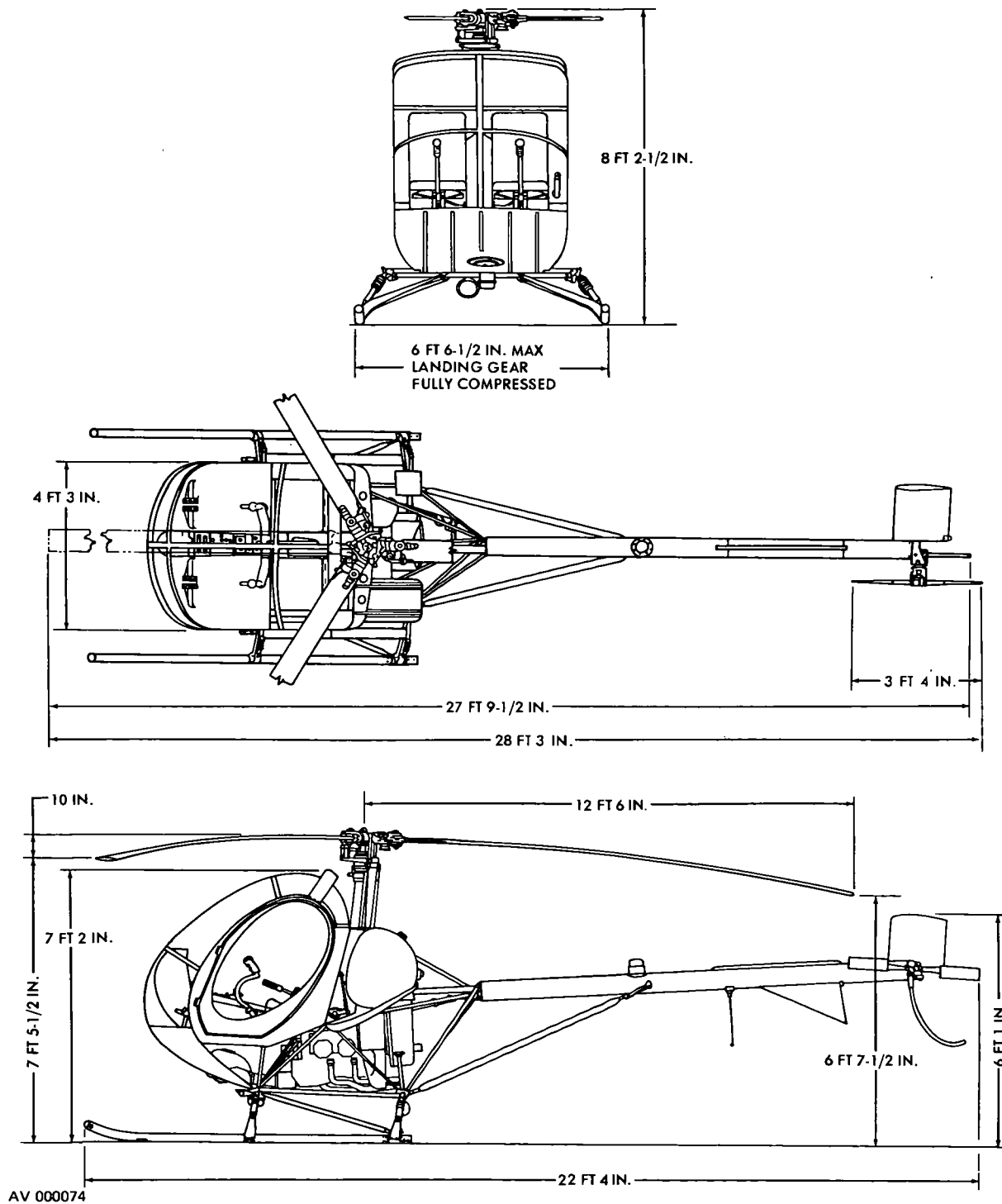


Figure 1-31. Principal dimensions, TH-55A (Osage)

1-57. TH-55A (Osage) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS
No. & model. . . (1)H10-360-B1A Mfr Lycoming FAA type cert. . 1E10 Engine to main rotor rear ratio 6:1	The TH-55A helicopter is manufactured by the Hughes Tool Company, Aircraft Division, Culver City, California. The mission of the TH-55A is the training of military pilots in the basic operation and performance of a helicopter. Training will be accomplished only in CONUS and from an established aviation training base. The two-place cabin is designed to accommodate an instructor and student with the seating arrangement side by side. The instructor and student each have a complete set of flight controls.		LB Empty 1008.1 Useful load 591.9 Design (gross) 1600 Combat NA Max takeoff 1600
ENGINE RATINGS		PERSONNEL	FUEL AND OIL
BHP RPM MIN Takeoff 180 2900 5 Normal 160 2700-2900 Cont. max power		Crew (normal). 2 Instructor pilot 1 Student pilot 1	Fuel: Grade. . . . 115/145 Spec MIL-G-5572 No. of tanks 1 Location. . Left rear of cabin Qty 25 gal Oil: Grade. . . . 1100 above 40°F, 1065 below 40°F Spec MIL-L-22851 No. tanks . 1 Qty 2 gal
DIMENSIONS	DEVELOPMENT		AVIONICS
Main rotor dia. . 27 ft, 5 in. Number of blades 3 Blade twist 8-deg washout Airfoil section . . NACA 0015 Length: Rotors operating . . . 28 ft, 3 in. Rotors static. . 22 ft, 4 in. Fuselage. 21 ft, 10-3/4 in. Height 8 ft, 2-1/2 in. Tread (static) . . 6 ft, 3 in.(approx) Main rotor gnd clearance: Operating 8 ft, 3-1/2 in. Static. 7 ft, 5-1/2 in. Tail rotor gnd clearance 3 ft, 2-1/2 in. Tail rotor: Number of blades 2 Delta 3 angle . 30 deg Rotor dia. . . . 3 ft, 4 in. Airfoil section NACA 0015 Horizontal stabilizer: Span (from boom centerline) . . 2 ft, 5 in. Airfoil section . . NACA 0015	Contract awarded June 1964 First acft delivered November 1964 Last production acft April 1969		ARMAMENT
			Refer to chapter 2.
			None.

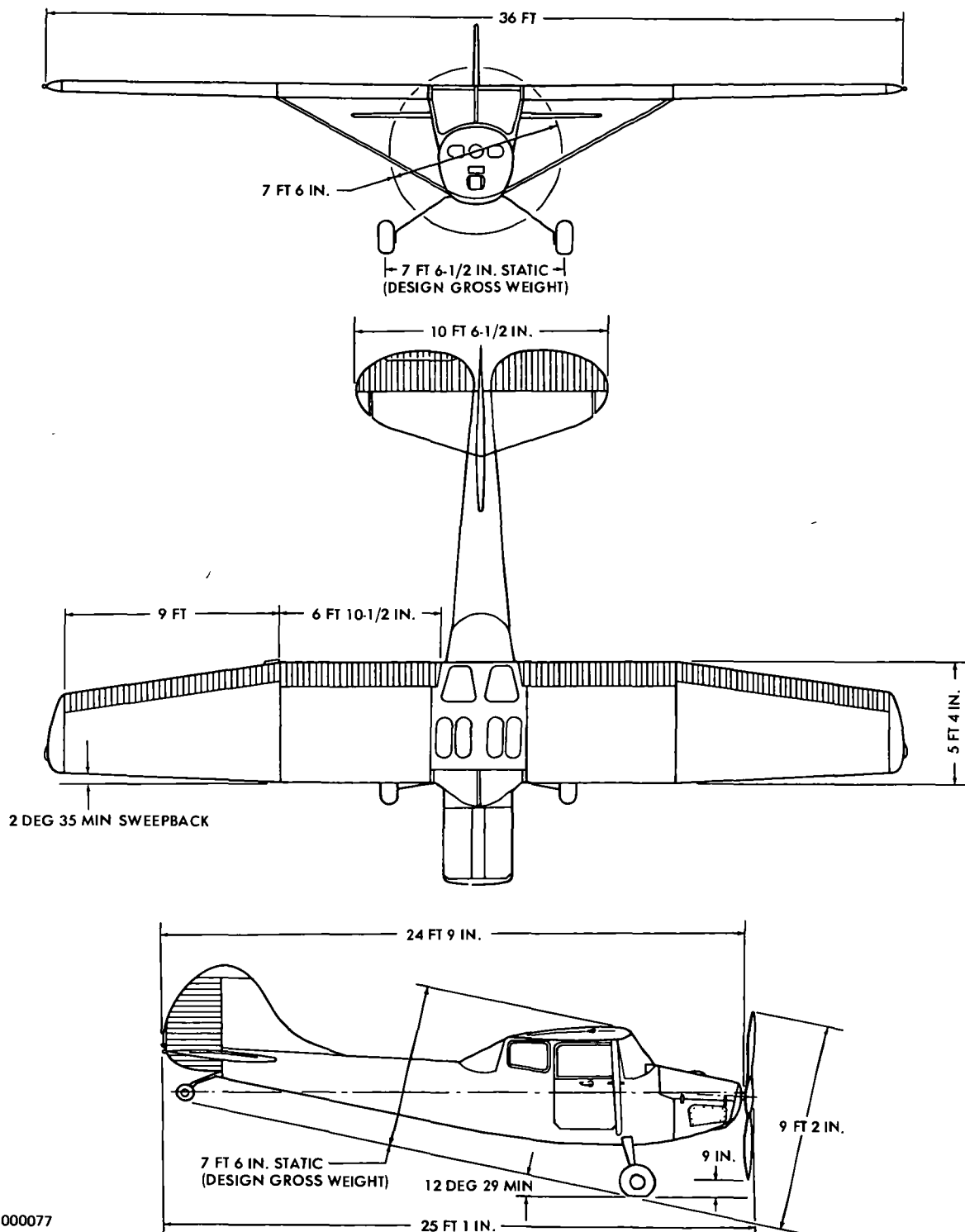
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1-58. Loading and Performance - Typical Mission, TH-55A (Osage).

CONDITIONS	BASIC MISSION
Fuel at 6.0 lb/gal (grade 91/96) (lb) . . .	150
Payload (lb) . . .	591.9
Cruise speed at SL (kn) . . .	75
Rate of climb at SL (ft/min) . . .	1400
Endurance (2700 rpm)	2-1/2 hrs at 65 knots cruise speed (min)
Hover ceiling, out of ground effect, 110°F (ft) . . .	1000 (min)
Normal autorotation speed (kn) . . .	45
Normal autorotation rotor speed (rpm) . . .	480
Autorotation rate of descent at 1000 ft, 100°F, 480 rpm and 45 knots (ft/min) . . .	1900 (max)
Altitude necessary to regain normal autorotation rotor speed from lower red line (ft) . . .	200 (max)
Range (normal) (nmi) . . .	200
Service ceiling (ft) . . .	11,000

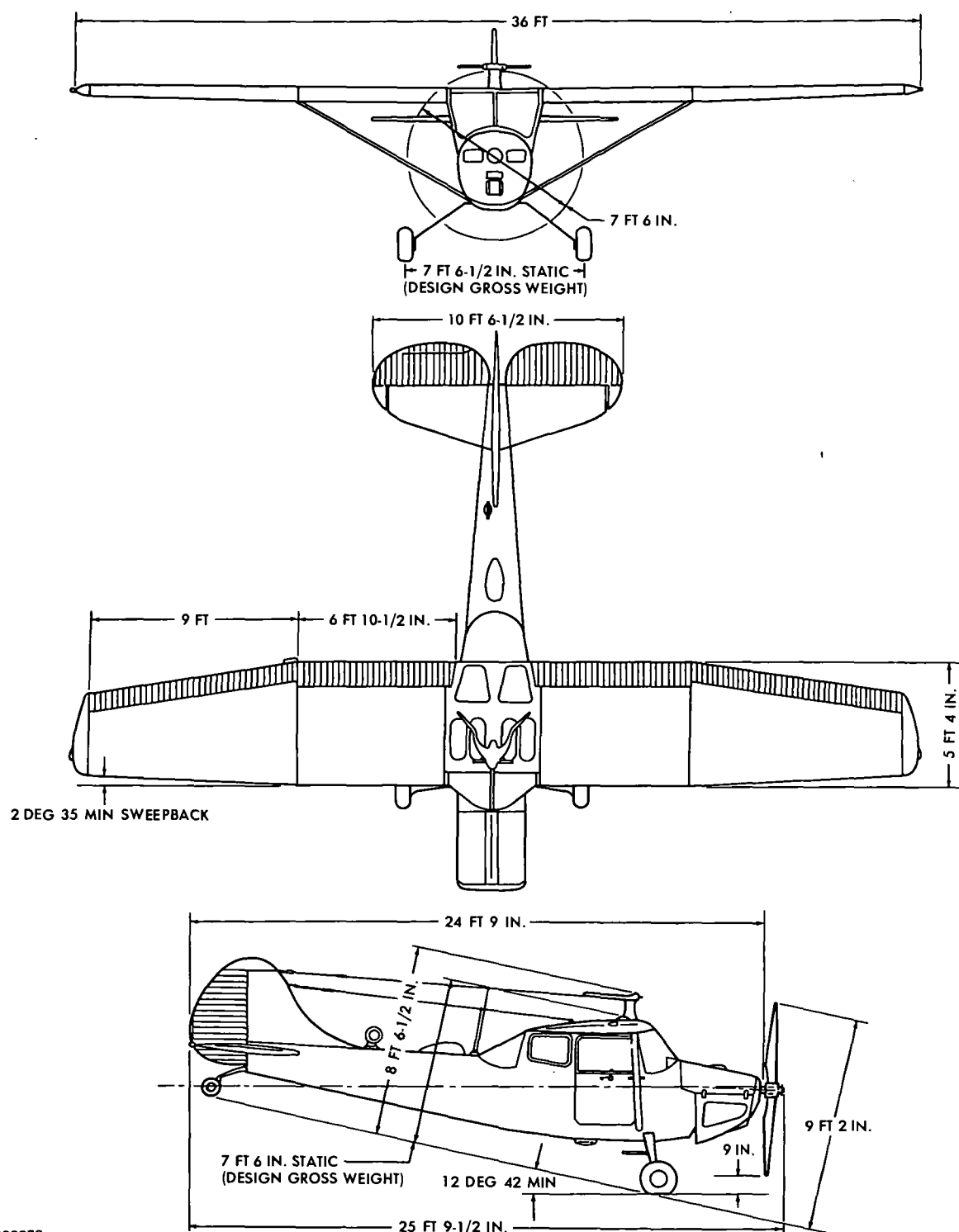


Figure 1-32. O-1D, E, and G (Bird Dog), typical (minor differences apparent between D, E, and G models)



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Figure 1-33. Principal dimensions, O-1E, and G (Bird Dog)



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Figure 1-34. Principal dimensions, O-1D (Bird Dog)

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1-59. O-1D (Bird Dog) Characteristics.

POWERPLANT				MISSION AND DESCRIPTION		WEIGHTS	
No. & model 1, 0-470-15 Mfr. Continental Engine spec No . . . 1435 Red. gear ratio D.D. Prop mfr McCauley Blade design No . . . 90M-O Prop type Constant speed No. blades 2 Prop dia 7 ft, 6 in.				Mfr's Model: Cessna 305B (Modified) The principal missions of the O-1D are reconnaissance and observation. The O-1D is a dual-controlled, all-metal, high-wing aircraft of semimono-coque construction. High-lift, slotted, electrically operated wing flaps are provided. The landing gear consists of two spring steel leaves. Tail-wheel steering is made possible by spring-loaded cables attached to the rudder control system. Provisions are made for tandem landing gear and skis or flotation gear. The pilot's seat is adjustable fore-and-aft on tracks. The observer's seat is removable to accept more cargo and is provided with a socket installation so the seat back can be changed to allow the observer to face fore or aft. Ambulance or cargo conversions are made by removing the rear seat back and installing the Gran portable stretcher or cargo as desired. The normal crew consists of pilot and observer. Litter patient or passenger may be carried in lieu of the observer.		Empty LB L.F. (calculated) 1724 Basic (calculated) . . 1729 Design 2400 4.4 Combat 1/2394 Max takeoff 2/2400 3/4.0 &4/3.5 Max landing +2400 +4.0 &4/3.5 1/ For basic mission. 2/ Limited by strength. 3/ Wing flaps retracted. 4/ Wing flaps extended.	
ENGINE RATINGS							
	BHP	RPM	ALT MIN				
Takeoff	213	2600	SL	5			
Normal	190	2300	SL	Cont.			
DIMENSIONS				DEVELOPMENT		FUEL AND OIL	
Wing: Span 36 ft. Incidence (root) 1 deg, 30 min Incidence (tip) . . 1 deg, 30 min Dihedral 2 deg, 8 min Sweepback (LE) 2 deg, 25 min Length 25 ft, 9-1/2 in. Height 9 ft, 2 in. Tread 7 ft, 6-1/2 in. Prop gnd clearance 9 in.				Design initiated May 1965 First flight (basic prototype) May 1965 First acceptance June 1965 Production completed November 1966		Fuel: Grade 80/87 or 115/145 Spec MIL-G-5572 No. tanks. . 2 Location . . Wings, inbd Qty 42 gal Oil: Grade 1100 above 0.0°C, 1065 below 0.0°C Spec MIL-L-6082 No. tanks. . 1 Location . . engine sump Qty 2-1/2 gal	
				CAPACITIES		FEATURES	
				Baggage compartment Length 1 ft, 11 in. Height 2 ft, 5 in. Width 2 ft Cargo compartment (rear seat removed) Length 4 ft, 11 in. Height 2 ft, 5 in. to 3 ft, 11 in. Width 2 ft, 2 in.		Tandem landing gear kit (prov). Skis and floats (prov). Dual flight controls. Self-sealing fuel tanks. Single-slotted flaps.	
						AVIONICS	
						Refer to chapter 2.	
						ARMAMENT	
						None.	

1-60. Loading and Performance - Typical Mission, O-1D (Bird Dog).

CONDITIONS	BASIC MISSION	FERRY RANGE
TAKEOFF WEIGHT (lb) ...	2400 ^{5/}	2200 ^{6/}
Fuel at 6.0 lb/gal (grade 80/87 or 115/145) .. (lb) ...	237	237
Payload (lb) ...	None	None
Wing loading (lb/sq ft) ...	13.8	12.6
Stall speed (power off) (kn) ...	48	46
Takeoff ground run at SL ^{1/} (ft) ...	370	300
Takeoff to clear 50 ft ^{1/} (ft) ...	750	620
Rate of climb at SL ^{2/} (fpm) ...	1140	1310
Time: SL to 10,000 ft ^{2/} (min) ...	12.2	10.3
Time: SL to 20,000 ft ^{2/} (min) ...	47.5	34.5
Service ceiling (100 fpm) ^{2/} (ft) ...	20,300	22,200
COMBAT RANGE ^{3/} (nmi) ...	461	473
Average cruising speed (kn) ...	105	104
Cruising altitude (ft) ...	10,000	10,000
Total mission time (hr) ...	4.4	4.6
COMBAT RADIUS ^{3/} (nmi) ...	206	....
Average cruising speed (kn) ...	105	....
Cruising altitude (ft) ...	10,000	....
Total mission time (hr) ...	4.0	....
FIRST LANDING WEIGHT ^{4/} (lb) ...	2294	....
Ground roll at SL (ft) ...	285	....
Total from 50 ft (ft) ...	645	....
COMBAT WEIGHT ^{4/} (lb) ...	2294	1989
Combat altitude ^{2/} (ft) ...	10,000	10,000
Combat speed ^{2/} (kn) ...	125	127
Combat climb ^{2/} (fpm) ...	695	930
Combat ceiling (500 fpm) ^{2/} (ft) ...	13,800	17,300
Service ceiling (100 fpm) ^{2/} (ft) ...	21,300	24,300
Takeoff ground run at SL ^{1/} (ft) ...	330	....
Takeoff to clear 50 ft ^{1/} (ft) ...	675	....
Rate of climb at SL ^{2/} (fpm) ...	1225	1505
Max speed at SL ^{2/} (kn) ...	133	134
Basic speed at 5000 ft ^{2/} (kn) ...	130	132
LANDING WEIGHT ^{4/} (lb) ...	2189	1989
Ground roll at SL (ft) ...	270	250
Total from 50 ft (ft) ...	620	585

^{1/}Takeoff power.^{2/}Normal power.^{3/}Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-61.^{4/}For RADIUS mission if radius is shown.^{5/}Includes crew of 2 at 400 lb.^{6/}Includes crew of 1 at 200 lb.

Performance Basis:

- Data source: Contractor flight tests.
- Performance is based on powers shown.

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1-61. Performance Notes, O-1D (Bird Dog).

FORMULA: RADIUS MISSIONS I & II

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 5000 feet at normal power, and return at long range speeds. Range-free allowances are 10 minutes of normal power for warm-ups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS I, II, III, & IV

Warm up, take off, climb on course to 5000 feet at normal power, and cruise out at long range speeds until all but reserve fuel is consumed. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus fuel for 20 minutes at sea level, and 5 percent of initial fuel for reserve.

PERFORMANCE REFERENCE

Cessna Report No. 305B-6506-014, Substantiating Data for Standard Aircraft Characteristics Charts.

1-62. O-1E (Bird Dog) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model (1) O-470-11 Mfr Continental Engine spec No . . 1276b Red. gear ratio . . D.D. Prop mfr McCauley Prop model No . . 1A200FM9047 Prop type Fixed pitch No. blades 2 Prop dia 7 ft, 6 in.	Mfr's Model: Cessna 305C The principal missions of the O-1E are reconnaissance and observation. The O-1E is a dual-controlled, all-metal, high-wing aircraft of semimonocoque construction. High-lift, slotted, electrically operated wing flaps are provided. The landing gear consists of two spring steel leaves. Tailwheel steering is made possible by spring-loaded cables attached to the rudder control system. Provisions are made for tandem landing gear and skis or flotation gear. The pilot's seat is adjustable fore-and-aft on tracks. The observer's seat is removable to accept more cargo and is provided with a socket installation so the seat back can be changed to allow the observer to face fore or aft. Ambulance or cargo conversions are made by removing the rear seat back and installing the Gran portable stretcher or cargo as desired. The normal crew consists of pilot and observer. Litter patient or passenger may be carried in lieu of the observer.		LB Empty (calculated) . . 1614 Basic (calculated) . . . 1618 Design 2400 Combat *2180 Max takeoff (alt) +2400 Max inflight +2400 Max landing +2400 L.F. 4.4 ±4.0 & *3.5 4.4 ±4.0 & *3.5	
ENGINE RATINGS	DEVELOPMENT		FUEL AND OIL	
*For basic mission. +Limited by strength. ±Wing flaps retracted. *Wing flaps extended.				
BHP RPM ALT MIN Takeoff 213 2600 SL 5 Normal 190 2300 SL Cont.	The observer's seat is removable to accept more cargo and is provided with a socket installation so the seat back can be changed to allow the observer to face fore or aft. Ambulance or cargo conversions are made by removing the rear seat back and installing the Gran portable stretcher or cargo as desired. The normal crew consists of pilot and observer. Litter patient or passenger may be carried in lieu of the observer.			
DIMENSIONS	CAPACITIES		FEATURES	
Wing: Span 36 ft Incidence (root) . 1 deg, 30 min Incidence (tip) . . -1 deg, 30 min Dihedral 2 deg, 8 min Sweepback (LE) . 2 deg, 35 min Length 25 ft, 9-1/2 in. Height 9 ft, 2 in. Tread 7 ft, 6-1/2 in. Prop gnd clearance 9 in.	Design initiated 1 December 1955 First flight (basic prototype) 1 January 1956 First acceptance December 1956 Production completed October 1957	Single-slotted flaps. Skis and floats (prov). Tandem landing gear kit (prov). Dual controls.		
	Baggage compartment Length 1 ft, 11 in. Height 2 ft, 5 in. Width 2 ft *Cargo compartment (rear seat removed) Length 4 ft, 11 in. Height 2 ft, 5 in. to 3 ft, 11 in. Width 2 ft, 2 in. *Includes baggage compartment.			
			AVIONICS	
			Refer to chapter 2.	
			ARMAMENT	
			None.	

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1-63. Loading and Performance - Typical Mission, O-1E (Bird Dog)

CONDITIONS	BASIC MISSION	DESIGN MISSION	ALTERNATE WEIGHT RANGE	FERRY RANGE
TAKEOFF WEIGHT (lb) ...	2291 ^{5/}	2165 ^{5/}	2400 ^{5/}	2089 ^{6/}
Fuel at 6.0 lb/gal (grade 80/87) (lb) ...	246	123	246	246
Payload (lb) ...	None	None	100	None
Wing loading (lb/sq ft) ...	13.2	12.4	13.8	12.0
Stall speed (power off) (kn) ...	47	46	48	45
Takeoff ground run at SL ^{1/} (ft) ...	350	310	390	285
Takeoff to clear 50 ft ^{1/} (ft) ...	620	560	675	525
Rate of climb at SL ^{2/} (fpm) ...	1115	1225	1035	1295
Time: SL to 10,000 ft ^{2/} (min) ...	12.4	11.0	14.2	10.3
Time: SL to 20,000 ft ^{2/} (min) ...	44.0 ^{7/}	39.7	44.0 ^{7/}	35.5
Service ceiling (100 fpm) ^{2/} (ft) ...	19,500	20,600	18,600	21,300
COMBAT RANGE ^{3/} (nmi) ...	455	196	449	454
Average cruising speed (kn) ...	86	86	86	86
Cruising altitude (ft) ...	5000	5000	5000	5000
Total mission time (hr) ...	5.3	2.3	5.3	5.3
COMBAT RADIUS ^{3/} (nmi) ...	209	83	....	....
Average cruising speed (kn) ...	86	86	....	....
Cruising altitude (ft) ...	5000	5000	....	....
Total mission time (hr) ...	4.9	2.0	....	....
FIRST LANDING WEIGHT ^{4/} (lb) ...	2180	2113	....	....
Ground roll at SL (ft) ...	290	280	....	....
Total from 50 ft (ft) ...	570	560	....	....
COMBAT WEIGHT ^{4/} (lb) ...	2180	2113	2179	1868
Combat altitude (ft) ...	5000	5000	5000	5000
Combat speed ^{2/} (kn) ...	101	101	101	101
Combat climb ^{2/} (fpm) ...	945	1000	945	1245
Combat ceiling (500 fpm) ^{2/} (ft) ...	13,000	13,700	13,000	16,600
Service ceiling (100 fpm) ^{2/} (ft) ...	20,400	21,000	20,400	23,400
Takeoff ground run at SL ^{1/} (ft) ...	310	290	....	....
Takeoff to clear 50 ft ^{1/} (ft) ...	565	535	....	....
Rate of climb at SL ^{2/} (fpm) ...	1210	1270	1210	1535
Max speed at SL ^{2/} (kn) ...	101	101	101	101

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1-63. Loading and Performance - Typical Mission, O-1E (Bird Dog) (CONT).

CONDITIONS	BASIC MISSION	DESIGN MISSION	ALTERNATE WEIGHT RANGE	FERRY RANGE
Basic speed at 5000 ft ^{2/} (kn) ...	101	101	101	101
LANDING WEIGHT ^{4/} (lb) ...	2070	2061	2179	1868
Ground roll at SL (ft) ...	275	275	290	250
Total from 50 ft (ft) ...	555	555	570	530

^{1/} Takeoff power.

^{2/} Normal power.

^{3/} Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-64.

^{4/} For RADIUS mission if radius is shown.

^{5/} Includes crew of 2 at 400 lb.

^{6/} Includes crew of 1 at 200 lb.

^{7/} Time to service ceiling.

Performance Basis:

a. Data source: Flight test of O-1E.

b. Performance is based on powers shown.

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1-64. Performance Notes, O-1E (Bird Dog).

FORMULA: RADIUS MISSIONS I & II

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 5000 feet at normal power, and return at long range speeds. Range-free allowances are 10 minutes of normal power for warm-ups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS I, II, III, & IV

Warm up, take off, climb on course to 5000 feet at normal power, and cruise out at long range speeds until all but reserve fuel is consumed. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus fuel for 20 minutes at sea level, and 5 percent of initial fuel for reserve.

PERFORMANCE REFERENCE

Cessna Report No. 991, Substantiating Data for Standard Aircraft Characteristics Charts.

1-122 1-66. Loading and Performance - Typical, O-1G (Bird Dog).

CONDITIONS	BASIC MISSION	DESIGN MISSION	ALTERNATE WEIGHT RANGE	FERRY RANGE
TAKEOFF WEIGHT	2291 ^{5/}	2165 ^{5/}	2400 ^{5/}	2089 ^{6/}
Fuel at 6.0 lb/gal (grade 80/87 or 115/145) ... (lb) ...	246	123	246	246
Payload	None	None	100	None
Wing loading	13.2	12.4	13.8	12.0
Stall speed (power off)	47	46	48	45
Takeoff ground run at SL ^{1/}	350	310	390	285
Takeoff to clear 50 ft ^{1/}	630	560	675	525
Rate of climb at SL ^{2/}	1115	1225	1035	1295
Time: SL to 10,000 ft ^{2/}	12.4	11.0	14.2	10.3
Time: SL to 20,000 ft ^{2/}	44.0 ^{1/}	39.7	44.0 ^{2/}	35.5
Service ceiling (100 fpm) ^{2/}	19,500	20,600	18,600	21,300
COMBAT RANGE ^{3/}	455	196	449	454
Average cruising speed	86	86	86	86
Cruising altitude	5000	5000	5000	5000
Total mission time	5.3	2.3	5.3	5.3
COMBAT RADIUS ^{3/}	209	83	....	....
Average cruising speed	86	86	....	....
Cruising altitude	5000	5000	....	....
Total mission time	4.9	2.0	....	....
FIRST LANDING WEIGHT ^{4/}	2180	2113	....	....
Ground roll at SL	290	280	....	....
Total from 50 ft	570	560	....	....
COMBAT WEIGHT ^{4/}	2180	2113	2179	1868
Combat altitude	5000	5000	5000	5000
Combat speed ^{2/}	101	101	101	101
Combat climb ^{2/}	945	1000	945	1245
Combat ceiling (500 fpm) ^{2/}	13,000	13,700	13,000	16,600
Service ceiling (100 fpm) ^{2/}	20,400	21,000	20,400	23,400
Takeoff ground run at SL ^{1/}	310	290		
Takeoff to clear 50 ft ^{1/}	565	535		
Rate of climb at SL ^{2/}	1210	1270	1210	1535

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1-66. Loading and Performance - Typical, O-1G (Bird Dog) (CONT).

CONDITIONS	BASIC MISSION	DESIGN MISSION	ALTERNATE WEIGHT RANGE	FERRY RANGE
Max speed at SL ^{2/} (kn) ...	101	101	101	101
Basic speed at 5000 ft ^{2/} (kn) ...	101	101	101	101
LANDING WEIGHT ^{4/} (lb) ...	2070	2061	2179	1868
Ground roll at SL (ft) ...	275	275	290	250
Total from 50 ft (ft) ...	555	555	570	530

^{1/} Takeoff power.^{2/} Normal power.^{3/} Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-67.^{4/} For RADIUS mission if radius is shown.^{5/} Includes crew of 2 at 400 lb.^{6/} Includes crew of 1 at 200 lb.^{7/} Time to service ceiling.

Performance Basis:

- a. Data source: Flight test of O-1E.
- b. Performance is based on powers shown.

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1-67. Performance Notes, O-1G (Bird Dog).

FORMULA: RADIUS MISSION I

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 5000 feet at normal power, and return at long range speeds. Range-free allowances are 10 minutes of normal power for warm-ups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Warm up, take off, climb on course to 5000 feet at normal power, cruise out to remote base at long range speeds, and return at long range speeds. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS I, II, & IV

Warm up, take off, climb on course to 5000 feet at normal power, and cruise out at long range speeds until all but reserve fuel is consumed. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus fuel for 20 minutes at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds to remote area, and lay wire. Climb on course to 5000 feet at normal power and return at long range speeds. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus 10 minutes of normal power for wire laying, fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

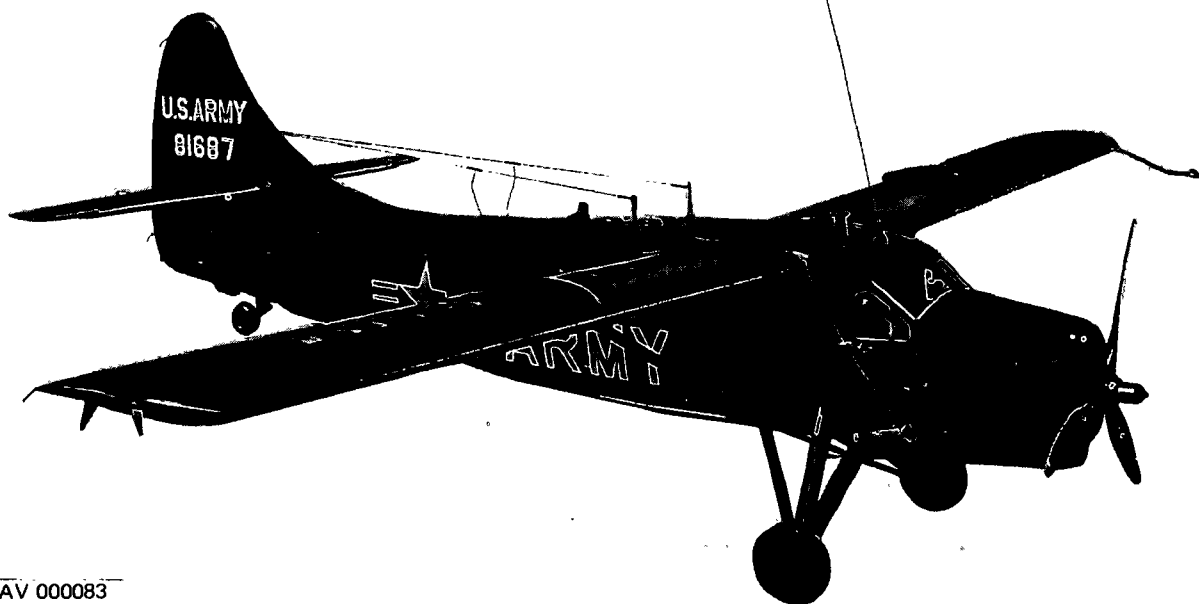
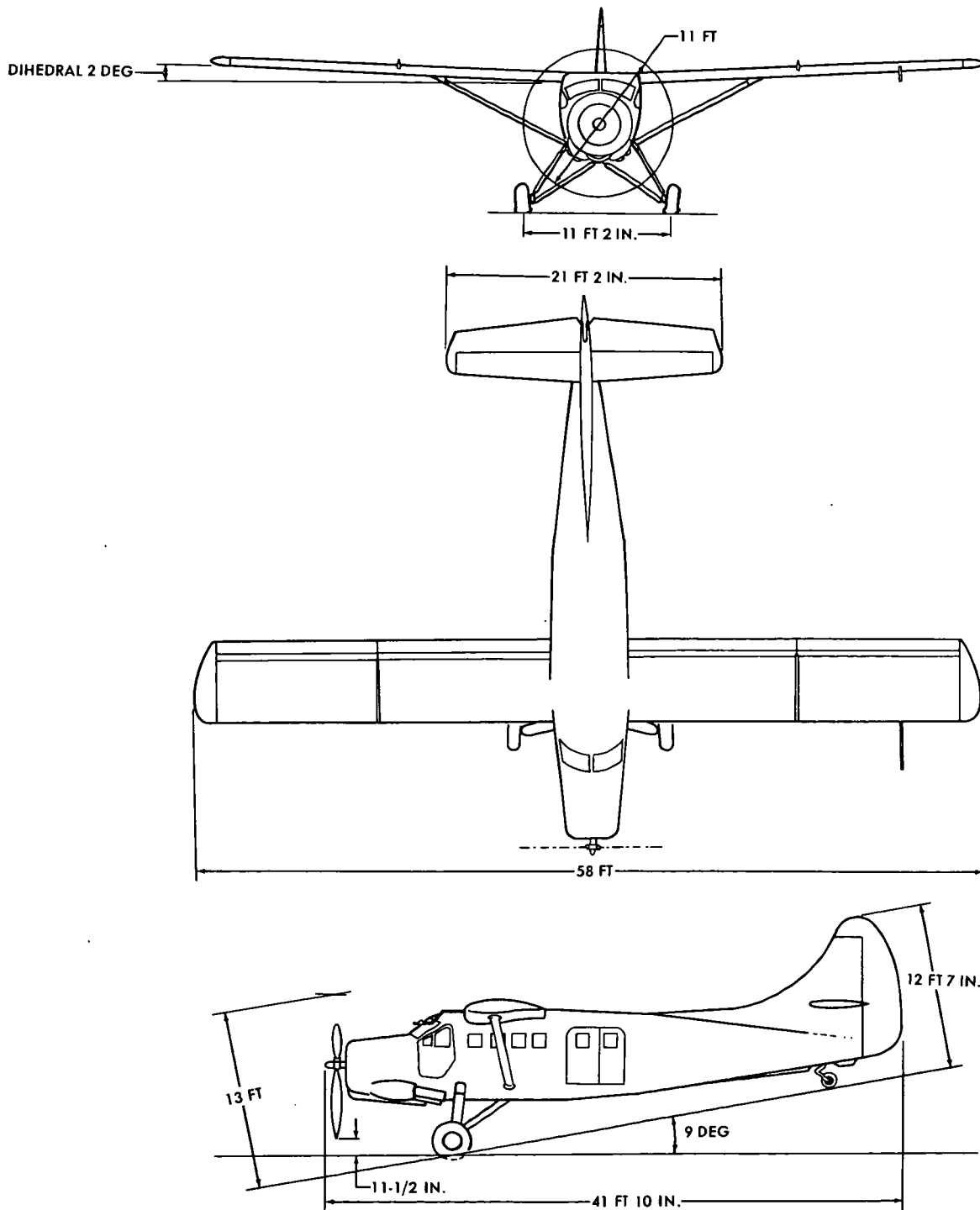


Figure 1-35. U-1A (Otter)

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Figure 1-36. Principal dimensions, U-1A (Otter)

1-68. U-1A (Otter) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model ... (1) R-1340-59/61 Mfr Pratt & Whitney Engine spec No .. 1053 Superch 1 stg, 1 spd Red. gear ratio .. 0.667 Prop mfr Ham Std Balde design No 7035A9 Prop type Hydromatic No. blades 3 Prop dia 10 ft. 9 in. Augmentation .. Exhaust thrust augmenter tubes	Mfr's Model: DeHaviland DHC-3 The principal mission of the U-1A aircraft is utility transport, light cargo hauling, and passenger service. It is designed to carry a pilot and ten passengers, one of whom may act as copilot. Alternate missions include casualty evacuation, supply dropping, reconnaissance, communications, liaison duties, and aerial surveys. The U-1A is an all-metal, high-wing, single-engine monoplane with a fixed landing gear which may be interchanged with twin floats for operation from water or combination wheel-skis for operation from snow or ice. The aircraft is equipped with a tailwheel power steering system to facilitate taxiing in strong winds and to permit holding a straight course in a cross-wind when on combination wheel-skis.		LB	L.F.
			Empty 4828	
			Basic 4900	
			Design 8000	3.5
		Combat (basic mission) 7615		
		Max takeoff ...*8000	3.5	
		Max landing ...*8000	3.5	
		*Limited by strength.		
		FUEL AND OIL		
		Fuel:		
		Grade 91/96		
		Spec MIL-F-5572		
		No. tanks 3		
		Location Fuselage		
		Qty 216 gal		
		Oil:		
		Grade 1100		
		Spec MIL-L-6082		
		No. tanks 1		
		Location Fuselage		
		Qty 10-3/4 gal		
		AVIONICS		
		Refer to chapter 2.		
		ARMAMENT		
		None.		
ENGINE RATINGS	DEVELOPMENT			
BHP RPM ALT MIN Takeoff 600 2250 SL S Normal 550 2200 SL Cont.	Production quantities delivered to U.S. Army completed Fiscal year 1959			
	CAPACITIES	PERSONNEL		
DIMENSIONS	Inside clearance	Crew (pilots) *1		
	Cabin:	Passengers **10		
Wing: Span 58 ft Incidence (root) . 2 deg, 30 min Incidence (tip) .. 2 deg, 30 min Dihedral 2 deg Sweepback 0.0 deg Length 41 ft, 10 in. Height 12 ft, 7 in. Tread 11 ft, 2 in.	Length (overall). 12 ft, 8 in.	or		
	Width (floor level) 4 ft, 4 in.	Litter patients 4		
	Height (max) .. 4 ft, 10-3/4 in.	plus		
	Baggage compartment:	Ambulatory patients ... 3		
	Length 3 ft, 8 in.	plus		
	Width 4 ft, 3-1/2 in.	Attendant 1		
	Height 4 ft, 8-1/2 in.	*Provisions for copilot.		
	Main cargo door	**Includes copilot.		
	Height 3 ft, 9 in.			
	Width 3 ft, 8-1/2 in.			
	Height above ground 3 ft, 10-1/2 in.			
	Limit floor loads			
	Cabin 100 lb/sq ft			
	Baggage compartment . 75 lb/sq ft			

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1-69. Loading and Performance - Typical Mission, U-1A (Otter).

CONDITIONS	BASIC MISSION	EVACUATION	FERRY RANGE
TAKEOFF WEIGHT (lb)...	8000 ^{5/}	6662 ^{6/}	6462 ^{5/}
Fuel at 6.0 lb/gal (grade 91/96) (lb)...	1020	1281	1281
Payload (outbound) (lb)...	1800	None	None
Payload (inbound) (lb)...	1800	1950	....
Wing loading (lb/sq ft)...	21.3	18.3	16.9
Stall speed (power off) (kn)...	58	58	44
Takeoff ground run at SL ^{1/} (ft)...	1050	660	420
Takeoff to clear 50 ft ^{1/} (ft)...	1600	1050	830
Rate of climb at SL ^{2/} (fpm)...	735	940	1070
Time: SL to 10,000 ft ^{2/} (min)...	17	11	10
Time: SL to 20,000 ft ^{2/} (min)...	43 ^{2/}	36	33
Service ceiling (100 fpm) ^{2/} (ft)...	18,800	22,400	23,000
COMBAT RANGE ^{3/} (nmi)...	680	....	800
Average cruising speed (kn)...	104	....	108
Initial cruising altitude (ft)...	5000	....	5000
Total mission time (hr)...	6.6	....	7.2
COMBAT RADIUS ^{3/} (nmi)...	325	350	....
Average cruising speed (kn)...	104	106	....
Cruising altitude (ft)...	5000	5000	....
Total mission time (hr)...	6.6	6.7	....
FIRST LANDING WEIGHT ^{4/} (lb)...	7750	5900	....
Ground roll at SL (ft)...	580	440	....
Total from 50 ft (ft)...	1160	880	....
COMBAT WEIGHT ^{4/} (lb)...	7750	8000	5862
Combat altitude (ft)...	5000	5000	5000
Combat speed ^{2/} (kn)...	136	136	137
Combat climb ^{2/} (fpm)...	720	690	1190
Combat ceiling (500 fpm) ^{2/} (ft)...	11,700	11,200	20,300
Service ceiling (100 fpm) ^{2/} (ft)...	19,800	18,800	27,200
Takeoff ground run at SL ^{1/} (ft)...	800	950	....
Takeoff to clear 50 ft ^{1/} (ft)...	1430	1630	....
Max rate of climb at SL ^{2/} (fpm)...	810	735	1400
Max speed at 5000 ft ^{2/} (kn)...	137	136	138
Basic speed at 5000 ft ^{2/} (kn)...	137	136	138
LANDING WEIGHT ^{4/} (lb)...	7750	7446	5149
Ground roll at SL (ft)...	540	560	390
Total from 50 ft (ft)...	1190	1150	780

^{1/} Max power.^{2/} METO power (max except takeoff).^{3/} Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-70.^{4/} For RADIUS mission if radius is shown.^{5/} Includes crew of 1 at 200 lb.^{6/} Includes crew of 2 at 400 lb.^{2/} Time to service ceiling.

Performance Basis:

- Data source: Flight test.
- Performance is based on powers shown.

1-70. Performance Notes, U-1A (Otter).**FORMULA: RADIUS MISSION I**

Warm up, take off, climb on course to 5000 feet at METO power, cruise out at long range speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 5000 feet at METO power, and return at long range speeds. Range-free allowances are 10 minutes of METO power for warm-ups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Same as Radius Mission I except the payload is loaded at remote area.

FORMULA: RANGE MISSIONS I & III

Warm up, take off, climb on course to 5000 feet at METO power, and cruise out at long range speeds until all but reserve fuel is consumed. Range-free allowances are 5 minutes of METO power for warmup

and takeoff, plus fuel for 20 minutes at sea level, and 5 percent of initial fuel for reserve.

GENERAL DATA

Engine ratings shown are engine manufacturer's guaranteed ratings. Power values used in performance calculations for the R-1340-59 and -61 engines are as follows:

	BHP	RPM	CRITICAL ALTITUDE
Max	600	2250	6000
METO . .	550	2200	8000

USABLE CUBAGE

Cabin (seats removed)	293 cu ft
Baggage compartment	70 cu ft

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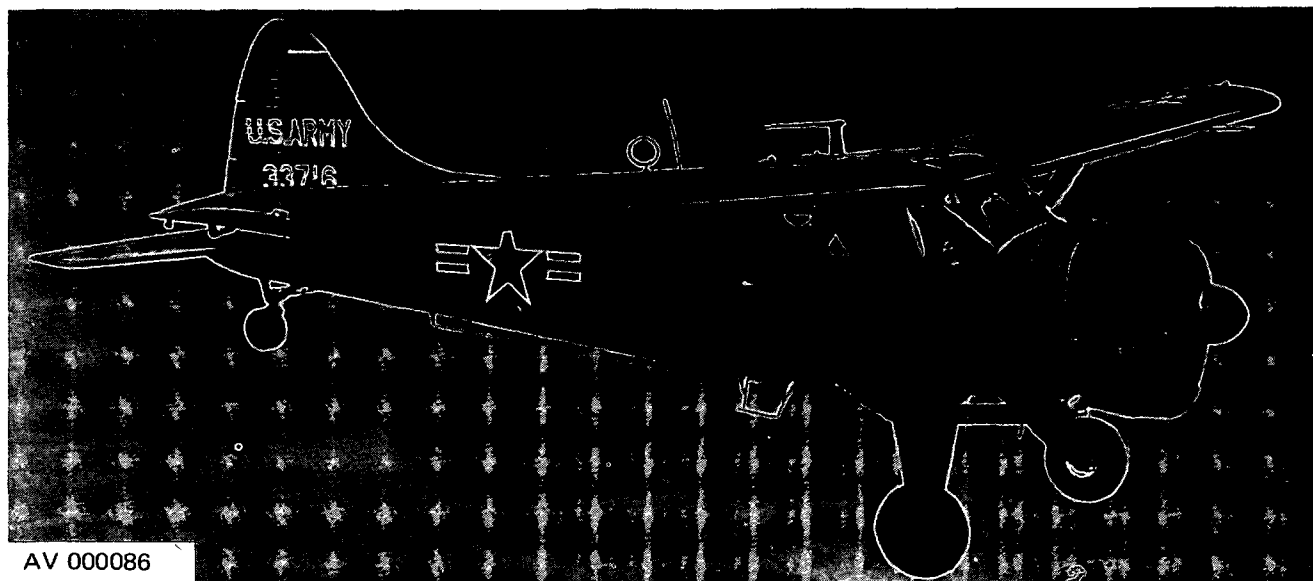


Figure 1-37. U-6A (Beaver), typical

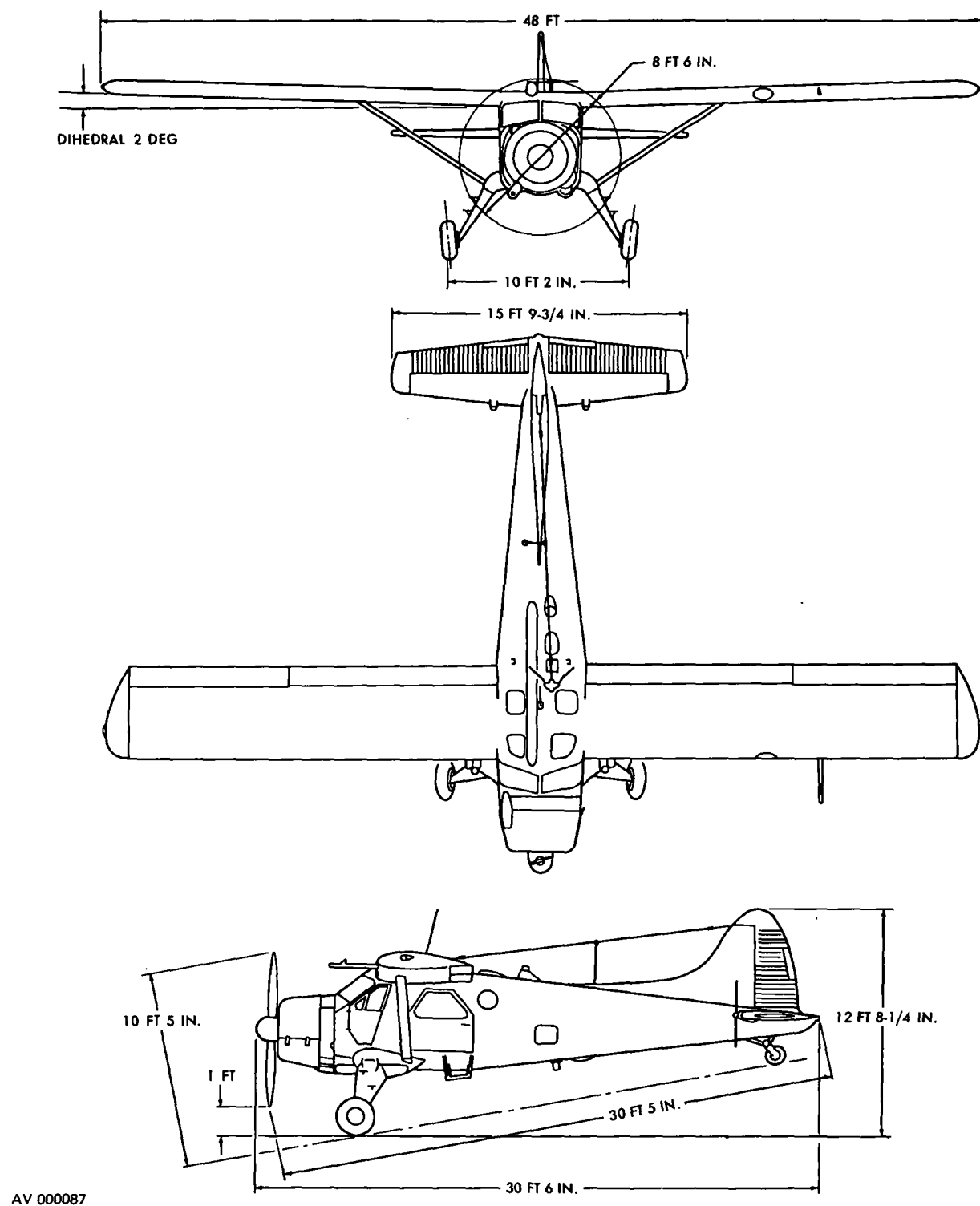


Figure 1-38. Principal dimensions, U-6A (Beaver)

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1-71. U-6A (Beaver) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model . . (1) R-985-AN-14B, -39, or -39A Mfr Pratt & Whitney Engine spec No. 2035 Superch 1 stg, 1 spd Red. gear ratio . D.D. Prop mfr Ham std Blade design No 6101A-18 Prop type Constant speed No. blades 2 Prop dia 8 ft, 6 in.	Mfr's Model: DeHavilland DHC-2 The principal mission of the U-6A aircraft is utility transport, light cargo hauling, and passenger service. It is designed to carry a pilot and five passengers, one of whom may act as copilot. Alternate missions include supply dropping, reconnaissance, instrument training, and light photographic duties. The U-6A is an all-metal, high-wing, single-engine monoplane with a fixed landing gear which may be interchanged with twin floats for operation from water and/or with skis for operation from snow or ice. There are provisions for two racks under each wing, each rack capable of carrying one 250-pound bomb or a chemical tank.		LB	L.F.
			Empty	3300
			Basic	3310
			Design	5100 3.3
			Combat (basic mission)	4559
			Max takeoff (overload)	*5100 3.3
			Max takeoff (normal)	**5100 3.3
			Max in flight	**5100 3.3
			Max landing	**5100 3.3
			*Limited by space.	
			**Limited by max takeoff weight.	
ENGINE RATINGS	DEVELOPMENT		FUEL AND OIL	
BHP RPM ALT MIN Takeoff 450 2300 SL 5 Normal 400 2200 SL Cont.	First acceptance October 1951 Production completed		Fuel:	
	FEATURES		Grade 91/96	
	PERSONNEL		Spec MIL-G-5572	
	Dual controls.		No. tanks	
	Provisions for two bomb racks under each wing capable of carrying 250 lb on each rack (500 lb on each wing).		(fuselage) 3	
	Filtered carburetor air induction system.		*(wing tip) 2	
			Qty 138 gal	
			*Some acft have external fuselage tank in lieu of wing tip tanks.	
			Oil:	
			Grade 1100	
			Spec MIL-L-6082	
			No. tanks 1	
			Location Fuselage	
			Qty 6-1/4 gal	
DIMENSIONS			AVIONICS	
Wing: Span 48 ft Incidence (root) . . 0.0 deg Incidence (tip) . . 0.0 deg Dihedral 2 deg Sweepback (LE) . . 0.0 deg Length 30 ft, 5 in. Height 10 ft, 5 in. Tread 10 ft, 2-1/2 in. Prop gnd clearance 1 ft			Refer to chapter 2.	
			ARMAMENT	
			None.	

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1-72. Loading and Performance - Typical Mission, U-6A (Beaver).

CONDITIONS	BASIC MISSION	EVACUATION RADIUS	WIRE LAY RADIUS	FERRY RANGE
TAKEOFF WEIGHT (lb) ...	5100	4499 ^{6/}	4246 ^{5/}	4299 ^{5/}
Fuel at 6.0 lb/gal (grade 91/96) (lb) ...	570	828	570	828
Payload (outbound) (lb) ...	1080	None	None	None
Payload (inbound) (lb) ...	1080	900	216	.....
Wing loading (lb/sq ft) ...	19.3	18.0	17.0	17.2
Stall speed (power off) (kn) ...	45	44	43	43
Takeoff ground run at SL ^{1/} (ft) ...	680	740	560	695
Takeoff to clear 50 ft ^{1/} (ft) ...	960	920	770	860
Rate of climb at SL ^{2/} (fpm) ...	985	1050	1220	1145
Time: SL to 10,000 ft ^{2/} (min) ...	11.5	10.5	9.0	9.5
Time: SL to 20,000 ft ^{2/} (min) ...	31.2 ^{2/}	35	27.2	30.3
Service ceiling (100 fpm) ^{2/} (ft) ...	19,900	20,450	22,400	21,400
COMBAT RANGE ^{3/} (nmi) ...	531	.....	.....	824
Average cruising speed (kn) ...	97	.....	.....	91
Cruising altitude (ft) ...	5000	.....	.....	5000
Total mission time (hr) ...	5.5	.....	.....	9.1
COMBAT RADIUS ^{3/} (nmi) ...	246	340	260	.....
Average cruising speed (kn) ...	97	95	92	.....
Cruising altitude (ft) ...	5000	5000	5000	.....
Total mission time (hr) ...	5.1	7.2	5.7	.....
FIRST LANDING WEIGHT ^{4/} (lb) ...	4559	4140	.....	.....
Ground roll at SL (ft) ...	650	525	.....	.....
Total from 50 ft (ft) ...	1240	1070	.....	.....
COMBAT WEIGHT ^{4/} (lb) ...	4559	5040	3742	3540
Combat altitude (ft) ...	5000	5000	5000	5000
Combat speed ^{1/} (kn) ...	141	132	141	132
Combat climb ^{1/} (fpm) ...	1110	865	1510	1590
Combat ceiling (500 fpm) ^{1/} (ft) ...	15,200	11,450	19,700	20,150
Service ceiling (100 fpm) ^{2/} (ft) ...	21,000	17,900	24,600	24,950
Takeoff ground run at SL ^{1/} (ft) ...	620	875	475	.....
Takeoff to clear 50 ft ^{1/} (ft) ...	865	1130	650	.....
Max rate of climb at SL ^{1/} (fpm) ...	1280	1040	1730	1830
Max speed at 2800 ft ^{1/} (kn) ...	142	132	142	132
Basic speed at 5000 ft ^{1/} (kn) ...	141	132	141	132

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1-72. Loading and Performance - Typical Mission, U-6A (Beaver) (CONT).

CONDITIONS	BASIC MISSION	EVACUATION RADIUS	WIRE LAY RADIUS	FERRY RANGE
LANDING WEIGHT ^{4/} (lb) ...	4309	4644	3517	3540
Ground roll at SL (ft) ...	605	610	495	455
Total from 50 ft (ft) ...	1180	1190	1020	965

^{1/} Max power.^{2/} Normal power.^{3/} Detailed descriptions of RADIUS and RANGE missions are given in paragraph 1-73.^{4/} For RADIUS mission if radius is shown.^{5/} Includes crew of 1 at 200 lb.^{6/} Includes crew of 2 at 400 lb.^{7/} Time to service ceiling.

Performance Basis:

- a. Data source: Flight test.
- b. Performance is based on powers shown.

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1-73. Performance Notes, U-6A (Beaver).**FORMULA: RADIUS MISSION I**

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds to remote base, and land. Without refueling, warm up, take off, climb on course to 5000 feet at normal power, and return at long range speeds. Range-free allowances are 10 minutes of normal power for warm-ups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION II

Same as Radius Mission I except that cargo is unloaded at remote base.

FORMULA: RADIUS MISSION III

Same as Radius Mission I except two litter and two ambulatory patients are loaded at the remote base.

FORMULA:

Warm up, take off, climb on course to 5000 feet at normal power, cruise out at long range speeds to remote area, and lay wire. Climb on course to 5000 feet at normal power and return at long range speeds. Range-free allowances are 5 minutes of normal power

for warmup and takeoff, plus 10 minutes of normal power for wire laying, fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS I, II, & V

Warm up, take off, climb on course to 5000 feet at normal power, and cruise out at long range speeds until all but reserve fuel is consumed. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus fuel for 20 minutes at sea level, and 5 percent of initial fuel for reserve.

GENERAL DATA

Engine ratings shown are engine manufacturer's guaranteed ratings. Power values used in performance calculations for the R-985-AN-14B, -39, and -39A engines are as follows:

	BHP	RPM	CLIMB CRITICAL ALTITUDE	LEVEL FLIGHT CRITICAL ALTITUDE
Max	450	2300	2600	2800
Normal . . .	400	2200	4400	4600

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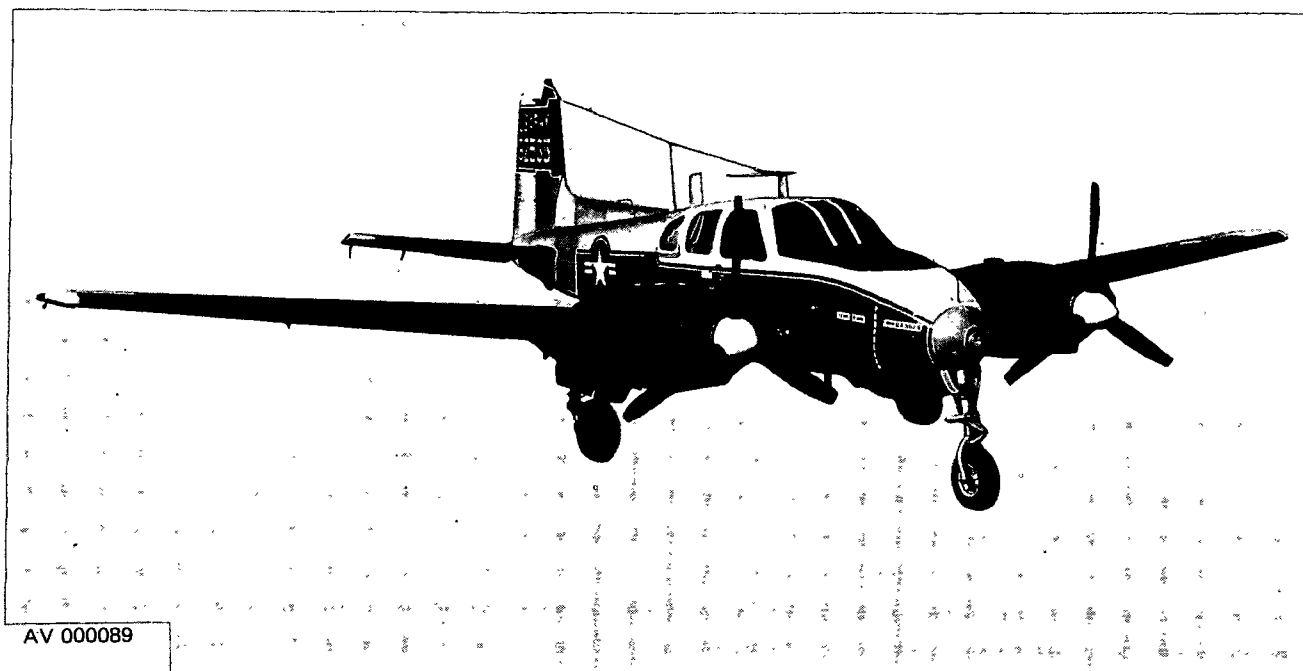
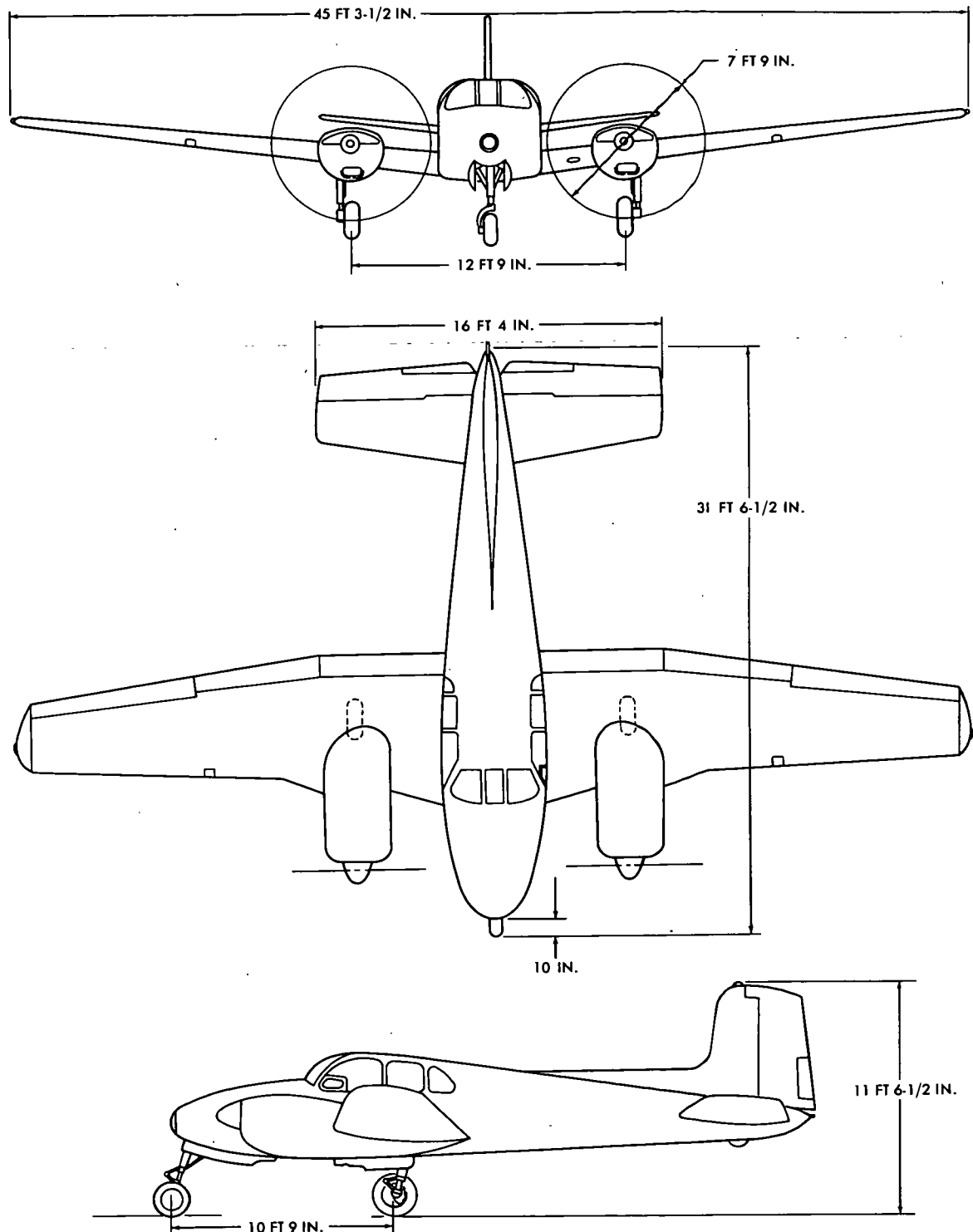


Figure 1-39. U-8D and G (Seminole), typical, (minor differences apparent between D and G models)



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Figure 1-40. Principal dimensions, U-8D (Seminole)

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1-74. U-8D/G* (Seminole) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) 0-480-1 Mfr Lycoming Engine spec No . . . 2202 Red. gear ratio . . . 0.642 Prop mfr Hartzell Blade design No . . . 10151-B8 Prop type Hydramatic, CC, FF Prop dia 7 ft, 9 in. No. blades 3 Superch 1 stg, centrif	Mfr's Model: Beech E-50 The principal mission of the U-8D is the transportation of personnel. The U-8D is a clean Cantilever, low-wing monoplane and can be quickly converted into a cargo carrier by removing the rear cabin seat and the right-hand front seat. The cabin arrangement allows the front seat to accommodate three persons abreast, the pilot on the left, assist pilot or passenger in the center, and a passenger on the right, while the rear seat accommodates three additional passengers. Emergency evacuation is accomplished by jettisoning the cabin door and by opening the rear cabin windows. The leading edge, main spar, and rear section of the wings are joined by piano-type hinge loops and stainless steel rods. Warm air system is utilized for anti-icing of windshields. The U-8D is similar to the U-8A and B, except it has three-blade metal propellers in lieu of two-blade metal propellers plus increased horsepower and gross weight. All U-8A and B aircraft have been modified to U-8D aircraft.		LB Empty (calculated) . . 4944 Basic (calculated) . . 4978 Design 7000 Combat (basic mission) 5953 Max takeoff (overload) *7300 Max takeoff (normal) *7300 Max landing **7000 *Limited by strength. **Limited by max takeoff weight.	L.F.

*U-8G incorporates a different seating arrangement, Airstair door, and extended cabin.

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1-75. Loading and Performance - Typical Mission, U-8D (Seminole)

CONDITIONS	BASIC MISSION	DESIGN MISSION	NORMAL MISSION	FERRY RANGE
TAKEOFF WEIGHT (lb) ...	7300 ^{4/}	7300 ^{4/}	7300 ^{4/}	6618 ^{4/}
Fuel at 6.0 lb/gal (grade 115/145) (lb) ...	1380	1062	1380	1380
Payload (outbound) (lb) ...	682	1000	682	None
Payload (inbound) (lb) ...	None	None	None	....
Wing loading (psf) ...	26.4	26.4	26.4	23.9
Stall speed (power off) (land config) (kn) ...	75.0	75.0	75.0	71.5
Takeoff ground run at SL ^{1/} (ft) ...	1430	1430	1430	1095
Takeoff to clear 50 ft ^{1/} (ft) ...	2385	2385	2385	1900
Rate of climb at SL ^{2/} (fpm) ...	1480	1480	1480	1780
Rate of climb at SL (one engine out) ^{2/} (fpm) ...	155	155	155	285
Time: SL to 10,000 ft ^{2/} (min) ...	7.8	7.8	7.8	6.5
Time: SL to 20,000 ft ^{2/} (min) ...	21.6	21.6	21.6	17.2
Service ceiling (100 fpm) ^{2/} (ft) ...	25,500	25,500	25,500	27,000
Service ceiling (one engine out) ^{2/} (ft) ...	9500	9500	9500	10,000
COMBAT RANGE (nmi) ...	1121	882	912	1185
Average cruising speed (kn) ...	140	140	171	139
Cruising altitude (ft) ...	10,000	10,000	10,000	10,000
Total mission time (hr) ...	8.08	6.43	5.45	8.55
COMBAT RADIUS ^{3/} (nmi) ...	528	387	430 ^{5/}	....
Average cruising speed (kn) ...	140	140	172	....
Cruising altitude (ft) ...	10,000	10,000	10,000	....
Total mission time (hr) ...	7.62	5.67	5.10	....
FIRST LANDING WEIGHT ^{3/} (lb) ...	6630	6768	6630	....
Ground roll at SL (ft) ...	1240	1266	1240	....
Total from 50 ft (ft) ...	2018	2063	2018	....
COMBAT WEIGHT ^{3/} (lb) ...	5948	5768	5948	5347
Combat altitude (ft) ...	10,000	10,000	10,000	10,000
Combat speed ^{2/} (kn) ...	199	199	199	200
Combat climb ^{2/} (fpm) ...	1550	1620	1550	1765
Combat ceiling (500 fpm) ^{2/} (ft) ...	24,100	25,000	24,100	26,500
Service ceiling (100 fpm) ^{2/} (ft) ...	29,700	30,500	29,700	31,700
Service ceiling (one engine out) ^{2/} (ft) ...	10,900	11,100	10,900	11,600
Takeoff ground run at SL ^{1/} (ft) ...	830	750	830	....
Takeoff to clear 50 ft ^{1/} (ft) ...	1485	1350	1485	
Rate of climb at SL ^{2/} (fpm) ...	2010	2090	2010	2250

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1-75. Loading and Performance - Typical Mission, U-8D (Seminole) (CONT).

CONDITIONS	BASIC MISSION	DESIGN MISSION	NORMAL MISSION	FERRY RANGE
Max speed at 9000 ft ^{2/} (kn) ...	200	200	200	200
Basic speed at 5000 ft ^{2/} (kn) ...	192	192	192	193
LANDING WEIGHT (lb) ...	5342	5445	5342	5347
Ground roll at SL (ft) ...	1000	1015	1000	1000
Total from 50 ft (ft) ...	1630	1640	1630	1630

^{1/} Max power.^{2/} METO power.^{3/} For RADIUS mission if radius is shown.^{4/} Includes crew of 1 at 200 lb.^{5/} 65-percent METO power used for cruise.

Performance Basis:

Phase IV flight test.

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1-76. Performance Notes, U-8D (Seminole).**FORMULA: RADIUS MISSIONS I & II**

Warm up, take off, climb on course to 10,000 feet at METO power, cruise out at long range speeds to remote base, land, and discharge passengers and baggage. Without refueling, warm up, take off, climb on course to 10,000 feet at METO power, and return at long range speeds. Range-free allowances are 10 minutes of METO power for warmups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, climb on course to 10,000 feet at METO power, cruise out at 65 percent power to remote base, land, and discharge passengers and baggage. Without refueling, warm up, take off, climb on course to 10,000 feet at METO power, and return at 65 percent power. Range-free allowances are 10 minutes of METO power for warmups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS I, II, & IV

Warm up, take off, climb on course to 10,000 feet at METO power, and cruise out at long range speeds until only reserve fuel remains. Range-free allowances are 5 minutes of METO power for warmup and takeoff, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, climb on course to 10,000 feet at METO power, and cruise out at 65 percent power until only reserve fuel remains. Range-free allowances are 5 minutes of METO power for warmup and takeoff, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

GENERAL DATA

Engine ratings shown are engine manufacturer's guaranteed ratings. Power values used in performance calculations for the O-480-1 engine are as follows:

	BHP	RPM	ALT	MIN
Max	340	3400	SL	5
METO	320	3200	SL	Cont.

PERFORMANCE REFERENCE

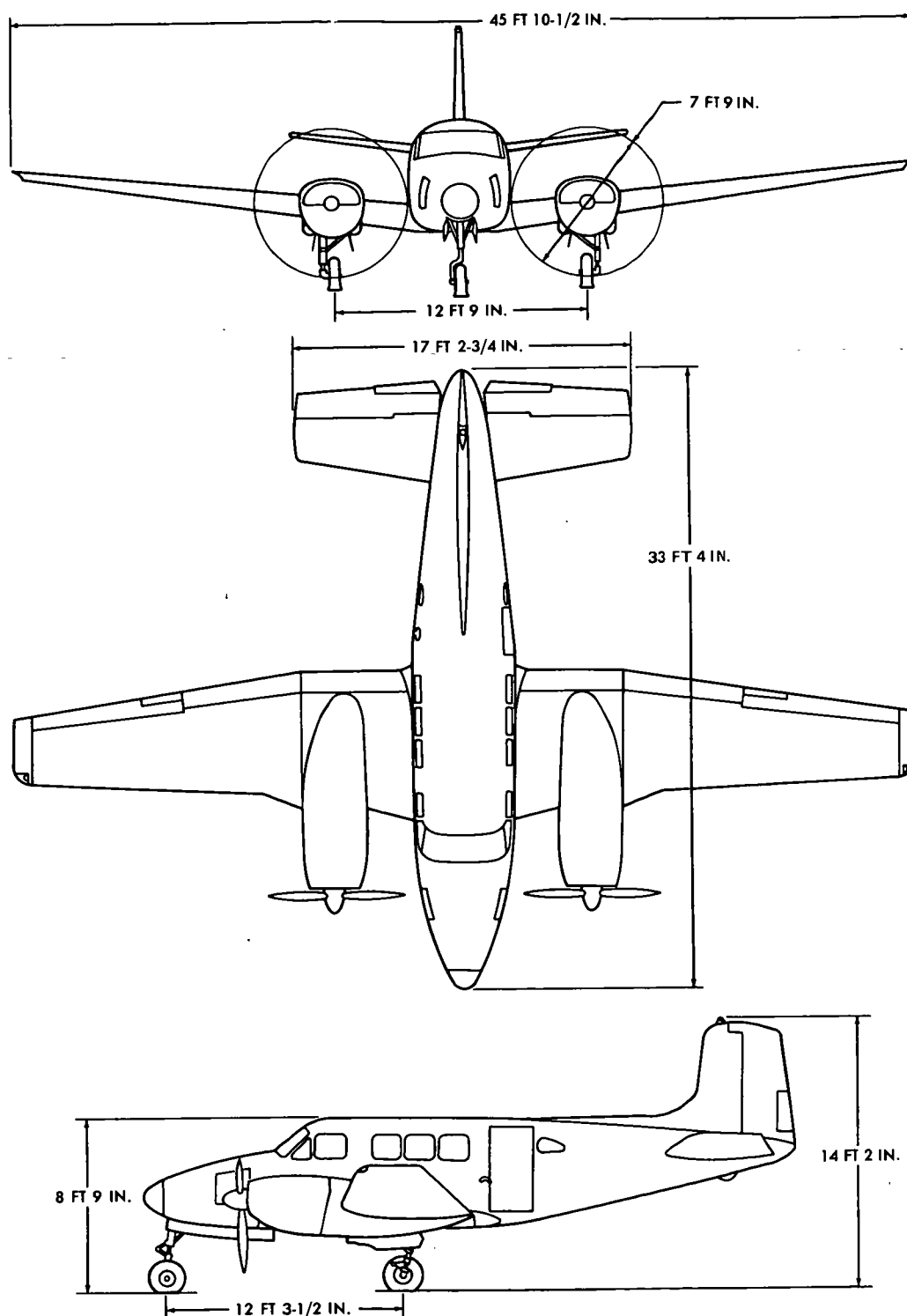
Beech Aerodynamic Report 691, Performance Data for the USAF Standard Aircraft Characteristics Charts from Phase IV Flight Test of the L-23D Airplane.

Beech Aerodynamic Report 725, U.S. Army Flight Manual Substantiating Data from USAF Phase IV Flight Tests (U-8D).

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Figure 1-41. U-8F (Seminole)



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Figure 1-42. Principal dimensions, U-8F (Seminole)

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1-77. U-8F (Seminole) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) 0-480-3 Mfr Lycoming Engine spec No . . 2228A Superch 1 stg, centrif Red. gear ratio . . 77:120 Prop mfr Hartzell Blade design No . . 10151-B8 Prop type Hyd, FF, CS No. blades 3 Prop dia 7 ft, 9 in. Augmentation . . . Fuel injection (3-piston type)	Mfg. Model: Beech The principal mission of the U-8F is the transportation of personnel. The U-8F is a semimonocoque, low-wing monoplane easily converted into a cargo carrier by removing the passenger compartment seats. The U-8F is similar to the U-8D except the larger fuselage is arranged with separate crew and passenger compartments. The crew compartment is arranged with the pilot's seat on the left and the copilot's seat on the right of a center aisle. It is equipped with dual flight controls and is separated from the passenger compartment with sliding doors. The passenger compartment is arranged with two passenger seats on the left and two or three passenger seats on the right of the center aisle. The track-mounted seats facilitate removal or installation and permit versatile seating arrangements. The baggage compartment is located at the rear of the passenger compartment with access from the passenger compartment. The cabin access door on the left side of the fuselage, aft of the wing, incorporates stair-type steps and may be opened or closed and locked from either the inside or outside. A jettisonable escape hatch is located opposite the cabin access door. Powerplants feature fuel injection and manually selected, electrically actuated inlet air source selection.		LB	L.F.
ENGINE RATINGS			Empty (calculated)	5246
			Basic (calculated) . .	5282
Takeoff			Design	7700 +6.6 -2.64
			Combat (basic mission)	6276
Normal			Max takeoff: (overload)	*7700
			(normal)	*7700
			Max landing	**7350 +6.6 -2.64
		*Limited by strength. **Limited by gear strength.		
		FUEL AND OIL		
		Fuel:		
		Grade 115/145		
		Spec MIL-G-5572		
		No. tanks 8		
		Location Wing		
		Qty 230 gal		
		Oil:		
		Grade S-1065,W-3050		
		Spec MIL-L-6082		
		MIL-L-15016		
		No. tanks 2		
		Qty 8 gal		
		AVIONICS		
		Refer to chapter 2.		
		ARMAMENT		
		None.		
DIMENSIONS	DEVELOPMENT			
Wing: Span 45 ft, 10-1/2 in. Incidence (root) . . 4 deg, 48 min. Incidence (tip) . . 0.0 deg Dihedral 7 deg Sweepback: Outer panel 25 percent chord .0.0 deg Center section 100 percent chord 0.0 deg Length 33 ft, 4 in. Height 14 ft, 2 in. Tread 12 ft, 9 in. Prop gnd clearance 10-1/2 in.	First flight August 1958			
	First delivery February 1959			
	Production completed December 1962			
	FEATURES	PERSONNEL		
	Thermostatically controlled cabin heat.	Crew 1		
	Fresh air and oxygen outlets at each station.	Passengers 5		
	Electrically actuated flaps.	Baggage compartment:		
	Conventional flight controls, manually operated.	Floor 150 lb		
	Steerable nose wheel.	Shelf 150 lb		
	Full feathering props.			
	Hydraulically controlled brakes.			
	Crossfeed fuel system.			
	Windshield wipers.			
	Deicing and anti-ice equipment.			

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1-78. Loading and Performance - Typical Mission, U-8F (Seminole).

CONDITIONS	BASIC MISSION	DESIGN MISSION	NORMAL MISSION	FERRY RANGE
TAKEOFF WEIGHT (lb) ...	7700 ^{4/}	7700 ^{4/}	7700 ^{4/}	6922 ^{4/}
Fuel at 6.0 lb/gal (grade 100/130) (lb) ...	1380	1158	1380	1380
Payload (outbound) (lb) ...	778	1000	778	None
Payload (inbound) (lb) ...	None	None	None	....
Wing loading (lb/sq ft) ...	27.5	27.5	27.5	24.7
Stall speed (power off) (kn) ...	72	72	72	68
Takeoff ground run at SL ^{1/} (ft) ...	1320	1320	1320	1000
Takeoff to clear 50 ft ^{1/} (ft) ...	2200	2200	2200	1720
Rate of climb at SL ^{2/} (fpm) ...	1304	1304	1304	1550
Rate of climb at SL (one engine out) (fpm) ...	184	184	184	310
Time: SL to 10,000 ft ^{2/} (min) ...	8.1	8.1	8.1	6.8
Time: SL to 20,000 ft ^{2/} (min) ...	19.1	19.1	19.1	15.7
Service ceiling (100 fpm) ^{2/} (ft) ...	27,000	27,100	27,100	30,000
Service ceiling (one engine out) ^{2/} (ft) ...	7800	7800	7800	13,500
COMBAT RANGE (nmi) ...	1104	898	883 ^{5/}	1220
Average cruising speed (kn) ...	134	135	171	127
Cruising altitude (ft) ...	10,000	10,000	10,000	10,000
Total mission time (hr) ...	8.38	6.67	5.23	9.61
COMBAT RADIUS ^{3/} (nmi) ...	539	434	415 ^{5/}	....
Average cruising speed (kn) ...	130	130	172	....
Cruising altitude (ft) ...	10,000	10,000	10,000	....
Total mission time (hr) ...	8.35	6.83	4.97	....
FIRST LANDING WEIGHT ^{3/} (lb) ...	7054	7119	7044	....
Ground roll at SL (ft) ...	1280	1310	1285	....
Total from 50 ft (ft) ...	2025	2075	2030	....
COMBAT WEIGHT ^{3/} (lb) ...	6276	6138	6266	5650
Combat altitude (ft) ...	10,000	10,000	10,000	10,000
Combat speed ^{2/} (kn) ...	203	203	203	204
Combat climb ^{2/} (fpm) ...	1685	1735	1670	1935
Combat ceiling (500 fpm) ^{2/} (ft) ...	27,200	27,700	27,100	29,800
Service ceiling (100 fpm) ^{2/} (ft) ...	32,500	32,900	32,400	34,600
Service ceiling (one engine out) ^{2/} (ft) ...	15,550	15,900	15,450	17,500
Takeoff ground run at SL ^{1/} (ft) ...	760	720	760	600
Takeoff to clear 50 ft ^{1/} (ft) ...	1355	1300	1360	1060
Max rate of climb at SL ^{2/} (fpm) ...	1825	1870	1820	2100
Max speed at 12,000 ft ^{2/} (kn) ...	207	207	207	208
Basic speed at 5000 ft ^{2/} (kn) ...	193	193	193	194
LANDING WEIGHT (lb) ...	5643	5632	5643	5643
Ground roll at SL (ft) ...	1065	1060	1065	1065
Total from 50 ft (ft) ...	1665	1660	1665	1665

^{1/}Maximum power - 3400 rpm.

^{2/}Normal power - 3200 rpm.

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1-78. Loading Performance - Typical Mission, U-8F (Seminole) (CONT).

3/For RADIUS mission if radius is shown.

4/Includes crew of 1 at 200 lb.

5/65-percent normal power used for cruise.

Performance Basis:

- a. Data source: Contractor's flight test.
- b. Performance is based on powers shown.

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1-79. Performance Notes, U-8F (Seminole).**FORMULA: RADIUS MISSIONS I & II**

Warm up, take off, climb on course to 10,000 feet at normal power, cruise out at long range speeds to remote base, land, and discharge passengers and baggage. Without refueling, warm up, take off, climb on course to 10,000 feet at normal power, and return at long range speeds. Range-free allowances are 10 minutes of normal power for warmups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RADIUS MISSION III

Warm up, take off, climb on course to 10,000 feet at normal power, cruise out at 65-percent power to remote base, land, and discharge passengers and baggage. Without refueling, warm up, take off, climb on course to 10,000 feet at normal power, and return at 65-percent power. Range-free allowances are 10 minutes of normal power for warmups and takeoffs, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSIONS I, II, & IV

Warm up, take off, climb on course to 10,000 feet at normal power, and cruise out at long range speeds until all but reserve fuel is consumed. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus fuel for 20 minutes at speeds for

long range at sea level, and 5 percent of initial fuel for reserve.

FORMULA: RANGE MISSION III

Warm up, take off, climb on course to 10,000 feet at normal power, and cruise out at 65-percent power until all but reserve fuel is consumed. Range-free allowances are 5 minutes of normal power for warmup and takeoff, plus fuel for 20 minutes at speeds for long range at sea level, and 5 percent of initial fuel for reserve.

PERFORMANCE REFERENCE

Beech Aerodynamic Report 677, Jackson, P.A., Type Inspection Report No. 50-20, Model 65 (L-23F), Gross Weight 7368 lb.

Beech Aerodynamic Report 678 and Appendixes A, B, C, and D, Hughes, A.C., Preliminary Flight-Test Evaluation L-23F Prototype.

Beech Aerodynamic Report 679, Jackson, P.A., Flight-Test Performance, Model 65 (L-23F), 7368 lb.

Beech Aerodynamic Report 695, Jackson, P.A., Type Inspection Report 65-2, Model 65 (L-23F), 7700 lb.

Beech Aerodynamic Report 732, Ross, H.C., U.S. Army Flight Manual Substantiating Data from Beech Flight Tests (L-23F).

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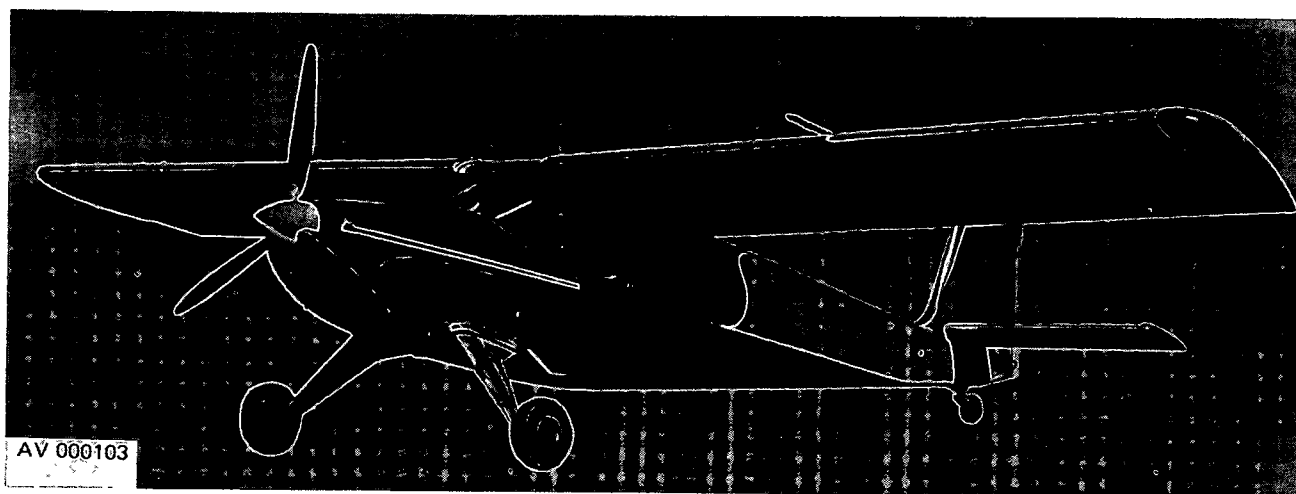


Figure 1-43. U-10A (Helio-Courier)

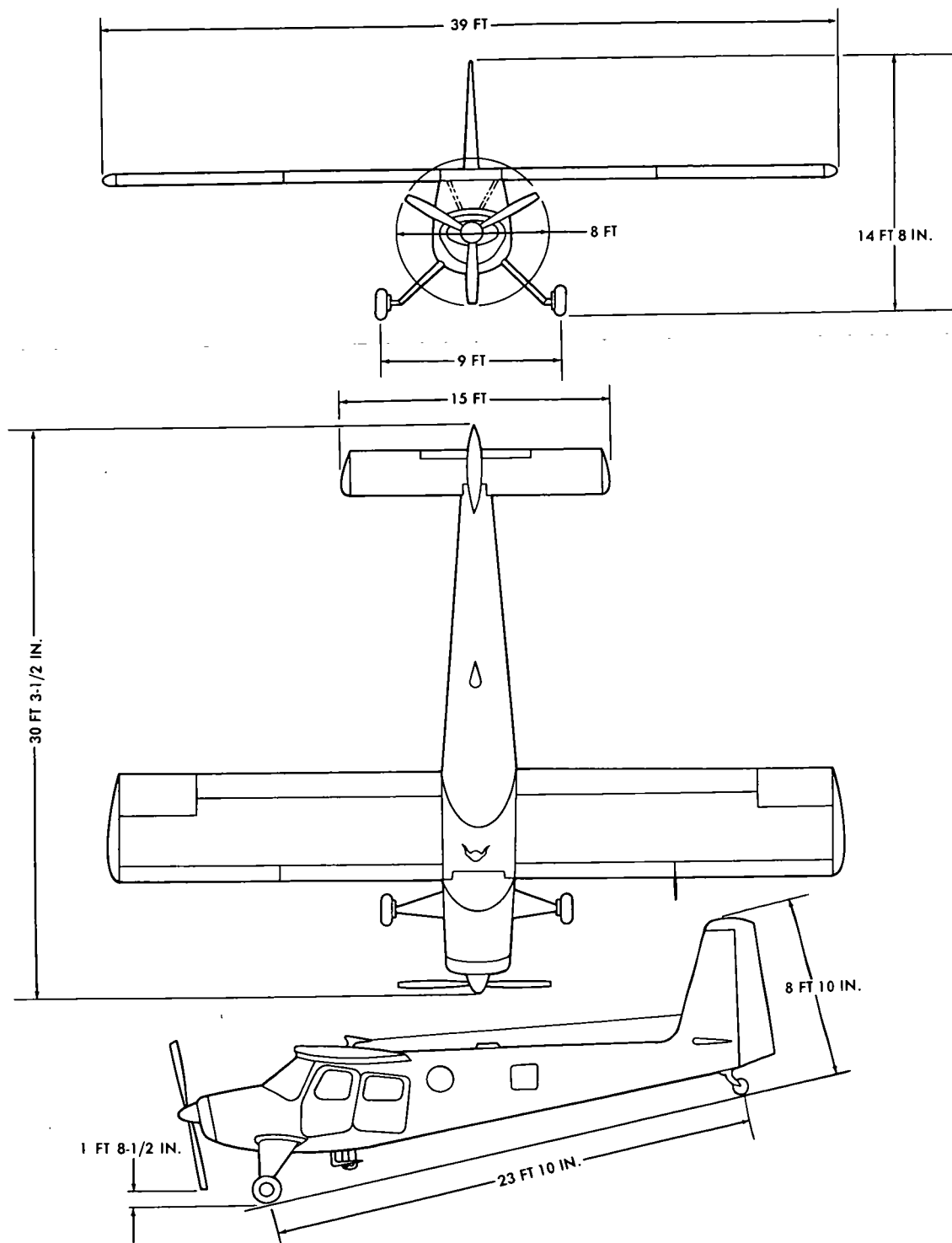


Figure 1-44. Principal dimensions, U-10A (Helio-Courier)

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1-80. U-10A (Helio Courier) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS
No. & model .....(1) GO-480-G1D6 Engine spec No ....2227B Superch .....NA Red. gear ratio ....0.641 (77:120) Prop mfr .....Hartzell Blade design No ....B3Z20-1/10151c-5 Prop type .....Hydraulic, constant speed No. blades .....3 Prop dia .....8 ft Prop type certificate No.....P-907-10	Mfr's Model: Helio-Courier Basic mission assignments of the U-10A aircraft include courier, observation, cargo carrying, parachute delivery and small groups, radio relay for extended periods of time, evacuation, and utility transport. The U-10A is a versatile air vehicle in the STOL category specifically designed to utilize small, rough, and unprepared fields and offering a maximum of protection for pilot and crew. Adaptability to floats and skis enables the airplane to operate on water and snow. The U-10A is an all-metal, high-wing, conventional-gear, four-place aircraft. The aerodynamic characteristics feature such items as long-span, high-lift type slotted flaps, and full-span leading edge slots. Lateral control is obtained by short-span, Frise-type, balanced ailerons which are operated in conjunction with leading edge spoilers. Ailerons alone are used for lateral control at higher speed. The airplane has an all-movable, slab-type, horizontal stabilizer with antibalance tab and a large vertical stabilizer and rudder. The U-10A is powered by a six-cylinder engine splined to a three-bladed propeller with a constant-speed control and spinner to aid engine cooling.		Empty LB Max takeoff (normal) 3000 Max takeoff (overload) ... 3920
ENGINE RATINGS			FUEL AND OIL
BHP RPM Takeoff 295 3400 Normal 280 2750			Fuel: Grade 100/130 Spec MIL-G-5572 No. tanks: Wing, left (1) 30 gal Wing, right (1) 30 gal Qty 60 gal Oil: Grade 1065, 1080 Spec MIL-L-6082 No. tanks 1 Location Engine sump Qty 2-1/2 gal
DIMENSIONS			AVIONICS
Wing: Span 39 ft Incidence 3 deg Dihedral 1 deg Sweepback (LE) outer panel 25 percent chord. 0.0 deg Sweepback (LE) center section 100 percent chord 0.0 deg Length 30 ft, 3-1/2 in. Height 8 ft, 10 in. Tread 9 ft Prop gnd clearance ... 1 ft, 8-1/2 in.	PERSONNEL Crew (normal) (pilot, copilot) 2 Passengers 2		Refer to chapter 2. ARMAMENT None.

1-81. Loading and Performance - Typical Mission, U-10A (Helio Courier).

CONDITIONS	BASIC MISSION
Max speed at SL (kn) ...	145
Max speed, 5000 ft (kn) ...	142
Min speed, power off, 40-deg flaps (kn) ...	42
Performance cruise at 6000 ft, 74-percent power, 2750 rpm (kn) ...	139
Range at 139 kn (nmi) ...	436 (no reserve)
Extended range cruise at 10,000 ft, 49-percent power, 2200 rpm (kn) ...	121
Range at 121 kn (nmi) ...	700 (no reserve)
Max endurance at 5000 ft, 29-percent power, 75 in TAS (hr) ...	9.14 (no reserve)
Service ceiling (100 fpm R/C) (ft) ...	22,000
Takeoff data at SL, 0 wing, 25-deg flaps, paved runway:	
Takeoff weight (lb) ...	3000
Ground roll (ft) ...	290
Total distance over 50-ft obstacle (ft) ...	500
Landing data at SL, 0 wind, 40-deg flaps, paved runway:	
Ground roll (ft) ...	180
Total distance over 50-ft obstacle (ft) ...	495

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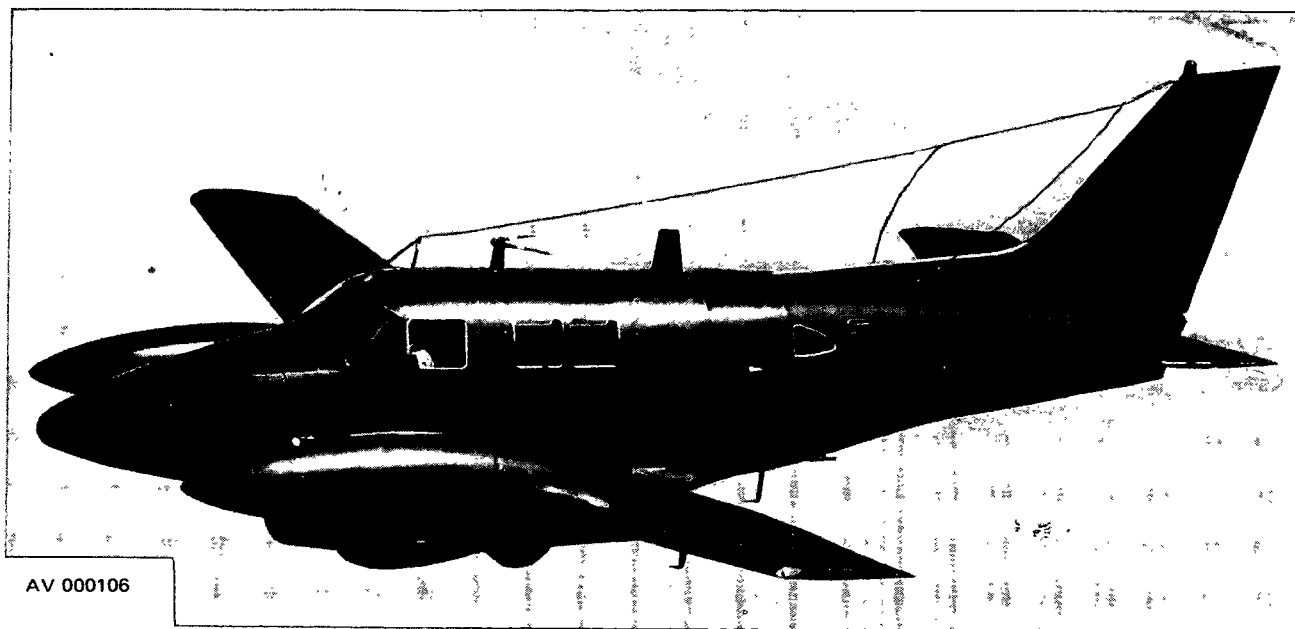
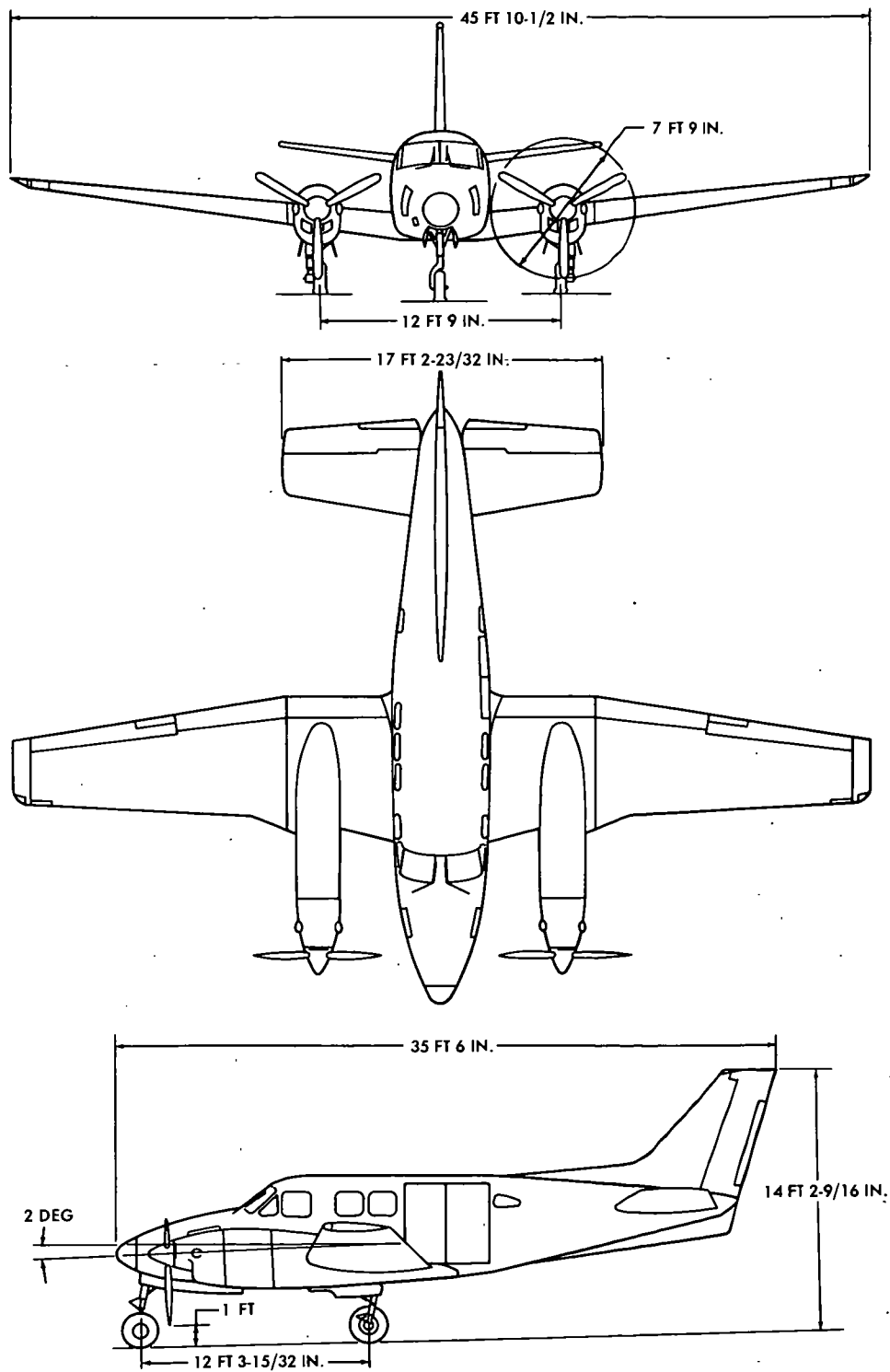


Figure 1-45. U-21A and RU-21A (Ute)



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Figure 1-46. Principal dimensions, U-21A and RU-21A (Ute)

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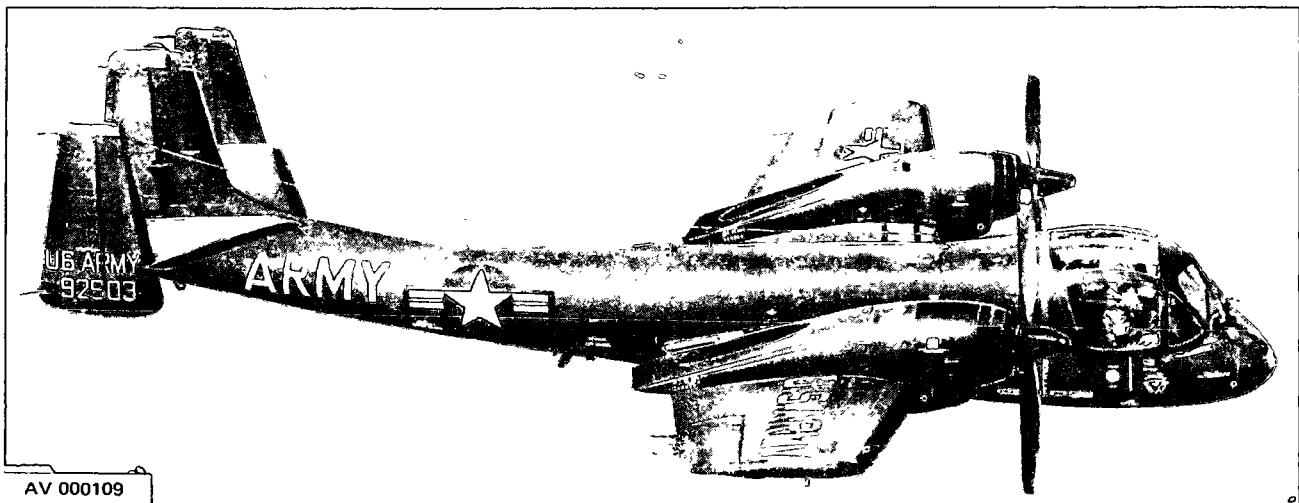
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Note:
RU-21A PT 6A-20 Modified for installation of special mission EW equipment.

1-83. Performance - Typical Mission, U-21A (UTE).

Payload	(lb) . .	2000 ^{1/}
Range	(nmi) . .	1249
Cruise speed ^{2/}	(kn) . .	180
Max speed	(kn) . .	230
Min takeoff distance	(ft) . .	1000
Min landing distance	(ft) . .	800
Rate of climb (1 engine)	(fpm) . .	350
Service ceiling (2 engines)	(ft) . .	25,000
Service ceiling (1 engine)	(ft) . .	10,000

^{1/} 3000 lb with fuel trade off.^{2/} True airspeed at normal rated power.~~FOR OFFICIAL USE ONLY~~



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Figure 1-47. OV-1A and C (Mohawk), typical, (minor differences apparent between A and C models)

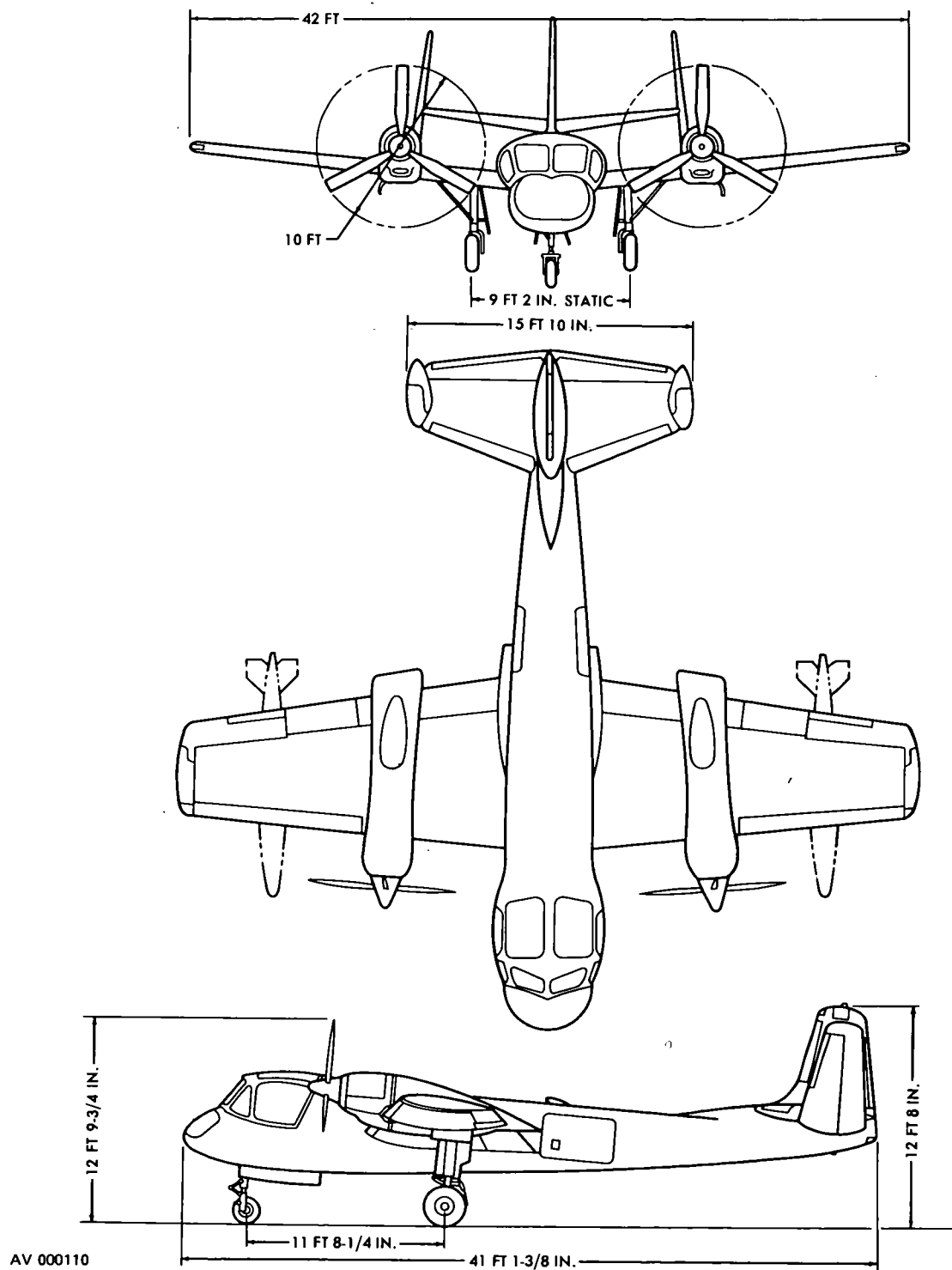


Figure 1-48. Principal dimensions, OV-1A and C (Mohawk)

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1-84. OV-1A (Mohawk) Characteristics.

POWERPLANT				MISSION AND DESCRIPTION		WEIGHTS	
No. & model. . . . (2) T-53-L-7				The primary missions of the OV-1A are visual reconnaissance and observation, and photographic reconnaissance. It is capable of performing missions of observation, artillery gunfire spotting, air control, emergency resupply, liaison, and radiological monitoring. The OV-1A is a two-place twin-turboprop aircraft capable of operating from small fields and unimproved runways. Design features include a dual-controlled, midwing, three-tail configuration of semimonocoque construction equipped with wide span flaps. The crew of two are seated side-by-side within a bubbled enclosure at the extreme forward end of the fuselage. A remotely operated, day-and-night KA-30 camera installation provides horizon-to-horizon photo coverage along the aircraft flight path. A nose-mounted KA-60, 70-mm panoramic camera is also provided. External provisions are incorporated to carry 150-gallon fuel tanks and emergency resupply containers.		LB	L.F.
Mfr Lycoming						Empty 9,400	
Type Free power turbine						Basic 9,781	
Engine spec No . . 104.11						Design 11,715	5.0
C & 21C						Combat (basic mission) 11,252	
Red. gear ratio . . 12.46						Normal takeoff. 12,012	
Prop mfr Ham std						Max takeoff . . . 15,020	
Blade design No . . 7103-6						Max landing . . . 15,020	
No. blades 3							
Prop dia 10 ft							
ENGINE RATINGS				DEVELOPMENT		FUEL AND OIL	
Rating/SL	SHP	SFC	Output RPM	First flight (prototype) April 1960 Estimated first service use September 1960		Fuel:	
Max(takeoff)	1100	.670	1700			Grade JP-4	
Mil	1000	.679	1700		Spec MIL-T-5624 or L-23699		
NRP	900	.692	1700		No. tanks:		
DIMENSIONS					Fuselage . . . (1) 292-1/2 gal		
Wing:					External . . . (2) 150 gal		
Area 330 sq ft					Total qty . . . 592-1/2 gal		
Span 42 ft					Oil:		
MAC 98 in.					Spec MIL-L-23699		
Length 41 ft, 1-1/2 in.					Qty 5 gal		
Height 12 ft, 8 in.					AVIONICS		
Tread 9 ft, 2 in.					Refer to chapter 2.		
					ARMAMENT		
					Refer to chapter 2.		

1-85. Loading and Performance - Typical Mission, OV-1A (Mohawk).

TAKEOFF LOADING CONDITION	OBSERVATION, NO STORES	NIGHT PHOTO TWO A6 EJECTORS	EMERGENCY RESUPPLY, TWO RESUPPLY CONTAINERS	FERRY, TWO 150-GAL EXT TANKS
	1	3	5	7
TAKEOFF WEIGHT (lb)...	12,012	12,273	13,647	14,371
Fuel (lb)...	1901	1901	1901	1901/1950
Payload (lb)...	.....	264	1500	.....
Wing loading (lb/sq ft)...	36.4	37.2	41.4	43.5
Stall speed (power-off) ^{1/} (kn)...	68	69	74	76
Takeoff run at SL - calm (ft)...	660 ^{6/}	722 ^{6/}	825 ^{7/}	1005 ^{7/}
Takeoff run at SL - 25-kn wind (ft)...	270 ^{6/}	320 ^{6/}	355 ^{7/}	430 ^{7/}
Takeoff to clear 50 ft - calm (ft)...	1010 ^{6/}	1080 ^{6/}	1255 ^{7/}	1450 ^{7/}
Max speed/altitude ^{1/} (kn/ft)...	260/10,000	257/10,000	245/9000	244/8000
Rate of climb at SL ^{1/} (fpm)...	2675	2560	2100	1935
Time: SL to 20,000 ft ^{1/} (min)...	11.0	12.0	16.0	18.5
Time: SL to 25,000 ft ^{1/} (min)...	16.5	18.4	28.0	35.0
Service ceiling (100 fpm) ^{1/} (ft)...	(Service ceiling above 25,000 ft)			23,800
Combat range ^{3/} (nmi)...	433	424	390	1195
Average cruising speed (kn)...	200	200	200	205
Cruising altitude(s)..... (ft)...	5000	5000	5000	20,000
Cruise time (hr)...	2.14	2.09	1.92	5.63
Mission time (hr)...	2.17	2.13	1.96	5.93
COMBAT LOADING CONDITION	NO STORES	TWO A6 EJECTORS	TWO RESUPPLY CONTAINERS	
	2	4	6	8
COMBAT WEIGHT (60 percent internal fuel) (lb)...	11,252	11,513	12,887	.....
Engine power Military	Military	Military	Military	.....
Fuel (lb)...	1141	1141	1141	.....
Combat speed/combat altitude (kn/ft)...	269/5000	266/5000	255/5000	.....
Rate of climb/combat altitude (fpm/ft)...	2860/5000	2752/5000	2253/5000	.....
Combat ceiling (1500 fpm) (ft)...	(Combat ceiling above 25,000 ft)			24,200
Rate of climb at SL (fpm)...	3310	3185	2645	.....
Max speed at SL (kn)...	264	261	251	.....
Max speed/altitude (kn/ft)...	270/10,000	267/10,000	256/8000	.....
LANDING WEIGHT (10 percent internal fuel) (lb)...	10,301	10,562	11,936	.....
Fuel (lb)...	190	190	190	.....
Stall speed-power-off ^{4/} approach power ^{2/} (kn)...	60/53	61/54	65/57	.....
Landing distance to clear 50-ft obstacle - calm .. (ft)...	858 ^{2/}	878 ^{2/}	1300 ^{8/}	

^{1/} Normal rated power.

^{2/} Military rated power.

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1-85. Loading and Performance - Typical Mission, OV-1A (Mohawk) (CONT).

3/See notes on mission specifications.

4/Flt idle power, propeller control at max rpm.

5/Power for level flight at 120 percent of stall speed-power off, propeller control at max rpm.

6/Takeoff distances are based upon takeoff and obstacle speeds satisfying minimum speeds for single-engine control and positive rate of climb as per detail spec 532-1..

7/Takeoff distances are based upon takeoff and obstacle speeds satisfying single-engine control.

8/Landing distance is based on a rate of sink of 8 ft per second.

9/Landing distance is based on a rate of sink of 14 ft per second.

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1-86. Loading and Performance - Typical Mission, OV-1A (Mohawk).**TACTICAL AIR OBSERVATION MISSION AND NIGHT PHOTOGRAPHY (Columns 1, 3, and 5, paragraph 1-86).**

Warm up, taxi, take off, climb on course to 5000 feet at normal rated power, and cruise at 200 knots at 5000 feet until all but reserve fuel is consumed. Range-free allowances are 5 minutes at normal rated power for warmup, taxi, and takeoff, plus 10 percent of initial internal fuel for reserve.

FERRY MISSION (Column 7, paragraph 1-86)

Warm up, taxi, take off, and climb on course to altitude for maximum range at normal rated power, cruise at altitude and velocity for maximum range until all but reserve fuel is consumed, and drop external fuel tanks when empty. Range-free allowances are 5 minutes at normal rated power for warmup, taxi, and takeoff, plus 10 percent of initial internal fuel for reserve.

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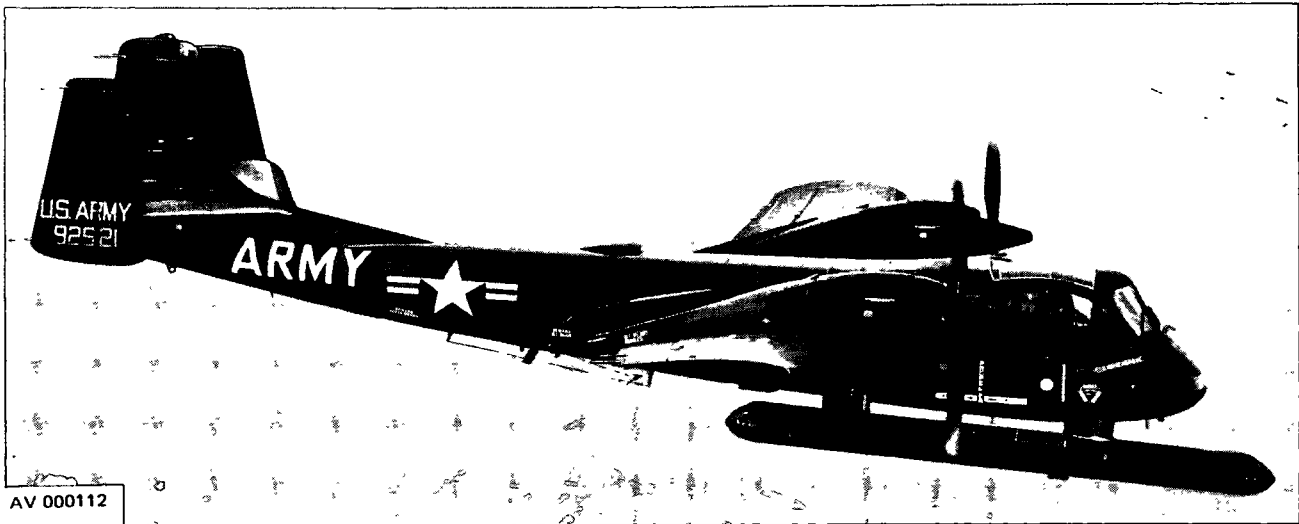
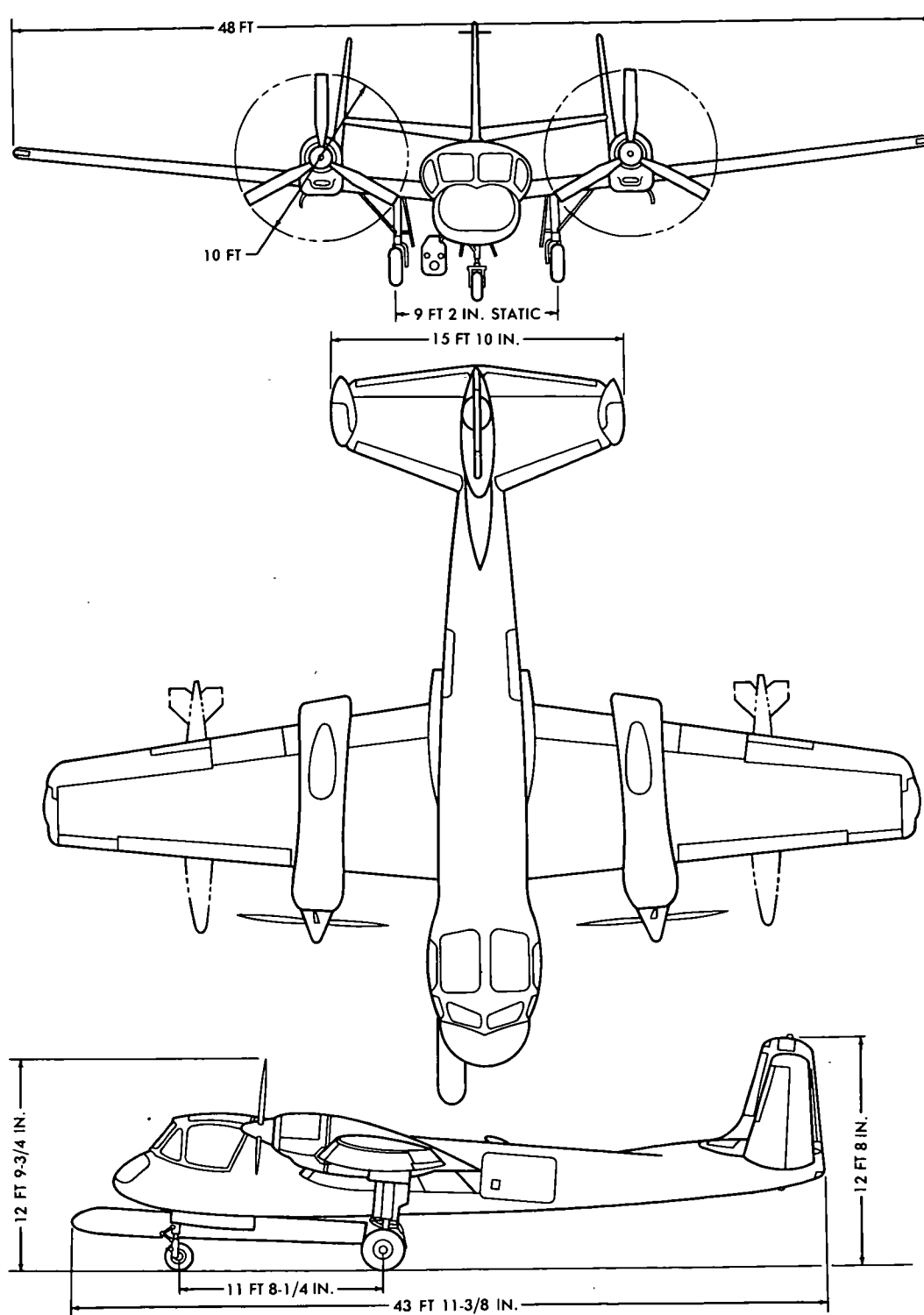


Figure 1-49. OV-1B (Mohawk)



AV 000113

Figure 1-50. Principal dimensions, OV-1B (Mohawk)

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1-87. OV-1B (Mohawk) Characteristics.

POWERPLANT				MISSION AND DESCRIPTION		WEIGHTS	
No. & model (2) T53-L-7 Mfr Lycoming Type Free power turbine Engine spec No .. 104.21B & .11C Red. gear ratio ... 12.4 Prop mfr Ham std Blade design No . 7125-6 No. of blades ... 3 Prop dia 10 ft				Mfr's Model: Grumman The primary mission of the OV-1B is electronic surveillance using the sidelooking airborne radar (SLAR). In addition, it is capable of performing missions of photographic reconnaissance, visual reconnaissance and observation, artillery gunfire spotting, air control, and radiological monitoring. The OV-1B is a two-place, twin-turboprop aircraft capable of operating from small fields and unimproved runways. Design features include a midwing, three-tail configuration of semimonocoque construction equipped with wide span flaps. The crew of two are seated side-by-side within a bubbled enclosure at the extreme forward end of the fuselage. A remotely operated day-and-night KA-30 camera installation provides horizon-to-horizon photo coverage along the aircraft flight path. The OV-1B carries an APS-94 side looking airborne radar antenna as standard equipment. External provisions are incorporated to carry two 150-gallon fuel tanks or two resupply containers.		LB L.F. Empty E 10,983 Basic 11,217 Design 13,100 4.0 Combat (basic mission) 12,882 Normal takeoff . 13,654 Max takeoff ... 16,643 Max landing ... 16,643	
ENGINE RATINGS						FUEL AND OIL	
		Output				Fuel:	
Rating/SL	SHP	SFC	RPM			Grade JP-4	
Max (takeoff)	1100	0.670	1700			Spec MIL-T-5624	
Mil	1000	0.679	1700			No. tanks:	
NRP	900	0.692	1700			Fuselage (1) 297 gal	
DIMENSIONS						External (2) 150 gal	
Wing: Area 360 sq ft Span 48 ft MAC 94.8 in. Length 43 ft. 11-1/2 in. Height 12 ft. 8 in. Tread 9 ft. 2 in.				External provisions are incorporated to carry two 150-gallon fuel tanks or two resupply containers.		Total Qty ... 597 gal	
				DEVELOPMENT		Oil:	
				First flight (prototype) November 1961 Estimated first service use January 1963		Spec MIL-L-23699	
						Qty 5 gal	
						AVIONICS	
						Refer to chapter 2.	
						ARMAMENT	
						Refer to chapter 2.	

1-88. Loading and Performance - Typical Mission, OV-1B (Mohawk).

TAKEOFF LOADING CONDITION	OBSERVATION, NO STORES 1	NIGHT PHOTO, TWO A6 EJECTORS 3	EMERGENCY RESUPPLY, TWO RESUPPLY CONTAINERS 5	FERRY, TWO 150-GAL EXT TANKS 7
TAKEOFF WEIGHT (lb) ...	13,654	13,915	15,168	15,918
Fuel internal/external (lb) ...	1930	1930	1930	1930/1950
Payload (lb) ...	....	264	1500	....
Wing loading (lb/sq ft) ...	38	38.7	42.1	44.6
Stall speed (power-off) ^{4/} (kn) ...	73	73.8	77	79
Takeoff run at SL - calm (ft) ...	995	1040	1270	1410
Takeoff to clear 50 ft - calm (ft) ...	1625	1690	2000	2185
Max speed/altitude ^{1/} (kn/ft) ...	240.5/12,500	238/12,000	226.8/10,000	226/8000
Rate of climb at SL ^{2/} (fpm) ...	2800	2700	2320	2160
Time: SL to 20,000 ft ^{2/} (min) ...	9.5	10	13	15
Time: SL to 25,000 ft ^{2/} (min) ...	15.5	16	23	26.5
Service ceiling (100 fpm) ^{2/} (ft) ...	29,500	28,750	26,500	24,900
Combat range ^{3/} (nmi) ...	365	358	334	1053
Average cruising speed (kn) ...	200	200	200	203
Cruising altitude (s) (ft) ...	5000	5000	5000	20,000
Cruise time (hr) ...	1.80	1.77	1.64	4.98
Mission time (hr) ...	1.84	1.80	1.69	5.30
COMBAT LOADING CONDITION	NO STORES 2	TWO A6 EJECTORS 4	TWO RESUPPLY CONTAINERS 6	
COMBAT WEIGHT (60 percent internal fuel) . (lb) ...	12,882	13,143	14,396	....
Engine power Military	Military	Military	Military	....
Fuel (lb) ...	1158	1158	1158	....
Combat speed/combat altitude ^{2/} (kn/ft) ...	250/5000	248/5000	238/5000	....
Rate of climb/combat altitude ^{2/} (fpm/ft) ...	2660/5000	2560/5000	2175/5000	....
Combat ceiling (500 fpm) ^{2/} (ft) ...	27,700	26,900	23,800	....
Rate of climb at SL ^{2/} (fpm) ...	3050	2940	2530	....
Max speed at SL ^{2/} (kn) ...	247.2	244.9	235.9	....
Max speed/altitude ^{2/} (kn/ft) ...	252/11,500	249.5/11,500	239.5/10,000	....
LANDING WEIGHT (10 percent internal fuel) (lb) ...	11,917	12,178	13,431	....
Fuel (lb) ...	193	193	193	....
Stall speed-power-off/approach power ^{5/} ... (kn) ...	67.5/54.6	68.2/55.2	71.5/58	
Landing distance clear 50-ft obstacle ... (ft) ...	870	890	1330	

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1-88. Loading and Performance - Typical Mission, OV-1B (Mohawk) (CONT).

1/ Normal rated power.

2/ Military rated power.

3/ See notes on mission specifications.

4/ Flight idle power, propeller control at max rpm.

5/ Power for level flight at 120 percent of stall speed, power off, propeller control at max rpm.

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1-89. Performance Notes, OV-1B (Mohawk).

TACTICAL AIR OBSERVATION MISSION AND NIGHT PHOTOGRAPHY (Columns 1, 3, and 5, paragraph 1-89).

Warm up, taxi, take off, climb on course to 5000 feet at normal rated power, and cruise at 200 knots at 5000 feet until all but reserve fuel is consumed. Range-free allowances are 5 minutes at normal rated power for warmup, taxi, and take off, plus 10 percent of initial internal fuel for reserve.

FERRY MISSION (Column 7, paragraph 1-89).

Warm up, taxi, take off, climb on course to altitude for maximum range at normal rated power, cruise at altitude and velocity for maximum range until all but reserve fuel is consumed, and drop external fuel tanks when empty. Range-free allowances are 5 minutes at normal rated power for warmup, taxi, and take off, plus 10 percent of initial fuel for reserve.

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1-90. OV-1C (Mohawk) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION	WEIGHTS
No. & model .....(2) T53-L-7/15 Mfr .....Lycoming Type .....Power free turbine Engine spec No ... 104.11C, .21-B and .35 Red. gear ratio 12.46 Prop mfr .....Ham std No. blades 3 Blade design No ... 7125-6 Prop dia 10 ft	Mfr's Model: Grumman The primary mission of the OV-1C is to perform Infrared (IR) reconnaissance missions using the Infrared sensor. In addition it is capable of performing photographic missions, visual reconnaissance and observation, artillery gunfire spotting, air control, and radiological monitoring. The OV-1C is a two-place, twin-turboprop aircraft capable of operating from small fields and unimproved runways. Design features include a midwing, three-tail configuration of semi-monocoque construction equipped with wide span flaps. The crew of two are seated side-by side within a bubbled enclosure at the extreme forward end of the fuselage. A remotely operated day-and night KA-30 or KA-76 camera installation provides horizon-to-horizon photo coverage along the aircraft flight path. A nose-mounted KA-60, 70-mm panoramic camera is also provided. The OV-1C carries AN/UAS-4 infrared detection equipment. The infrared surveillance system makes it possible to detect military terrestrial targets by inherent characteristics that are distinguishable in the visual and infrared portion of the electromagnetic spectrum. External provisions are incorporated to carry two 150-gallon fuel tanks or two resupply containers.	LB L.F. Empty 10,011 Basic 10,379 Design 11,924 4.9/4.0 Combat (basic mission) 12,296 Normal takeoff . 12,682 Max takeoff ... 15,302 Max landing ... 15,302
ENGINE RATINGS		FUEL AND OIL
T53-L-7 Rating/SL SHP SFC Output RPM Max (takeoff) 1100 0.670 1700 Mil 1000 0.679 1700 NRP 900 0.692 1700 T52-L-15 Rating/SL SHP SFC Output RPM Mil 1160* 0.620 1700 NRP 1000* 0.650 1600 *Mechanical limited.		Fuel: Grade JP-4 Spec MIL-T-5624 No. tanks: Fuselage (1) 297 gal External (2) 150 gal Total qty 597 gal Oil: Spec MIL-L-23699 Qty 5 gal
ARMAMENT	DEVELOPMENT	AVIONICS
Refer to chapter 2.	First flight (prototype) March 1961 First service use July 1961	Refer to chapter 2.
		DIMENSIONS
		Wing: Area 330 sq ft Span 42 ft/48 ft MAC 98 in. Length 41 ft, 1-1/2 in. Height 12 ft, 8 in. Tread 9 ft, 2 in.

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1-91. Loading and Performance - Typical Mission, OV-1C (Mohawk).

TAKEOFF LOADING CONDITION	OBSERVATION NO STORES 1	NIGHT PHOTO, TWO A6 EJECTORS 3	EMERGENCY RESUPPLY TWO RESUPPLY CONTAINERS 5	FERRY, TWO 150-GAL EXT TANKS 7
TAKEOFF WEIGHT (lb) ...	12,682	12,943	14,197	14,961
Fuel (lb) ...	1930	1930	1930	3880
Payload (lb) ...	....	264	1500	....
Wing loading (lb/sq ft) ...	38.4	39.2	43.0	45.3
Stall speed (power-off) ^{4/} (kn) ...	74	74	78	80
Takeoff run at SL - calm ^{6/} (ft) ...	990	1040	1270	1440
Takeoff run at SL - 25-kn wind ^{6/} (ft) ...	613	640	802	930
Takeoff to clear 50 ft - calm ^{6/} (ft) ...	1640	1680	2000	2230
Max speed/altitude ^{1/} (kn/ft) ...	246/10,000	243/10,000	229/5000	230/SL
Rate of climb at SL ^{1/} (fpm) ...	2270	2175	1800	1630
Time: SL to 20,000 ft ^{1/} , ^{2/} (min) ...	14/12	15/13	22/17	27/22
Time: SL to 25,000 ft ^{1/} , ^{2/} (min) ...	24/20	27/22	47/35	64/47
Service ceiling (100 fpm) ^{1/} , ^{2/} (ft) ...	26,200/27,450	25,700/26,500	21,600/23,200	20,200/21,300
Combat range ^{3/} (nmi) ...	408	397	362	1081
Average cruising speed (kn) ...	200	200	200	215
Cruising altitude(s) (ft) ...	5000	5000	5000	20,000
Cruise time (hr) ...	2.01	1.96	1.78	4.72
Mission time (hr) ...	2.05	2.00	1.83	5.17
COMBAT LOADING CONDITION	NO STORES 2	TWO A6 EJECTORS 4	TWO RESUPPLY CONTAINERS 6	
COMBAT WEIGHT (60 percent internal fuel) (lb) ...	11,910	12,171	13,425	....
Engine power Military	Military	Military	Military	....
Fuel (lb) ...	1158	1158	1158	....
Combat speed/combat altitude ^{2/} (kn/ft) ...	256/5000	252/5000	240/5000	....
Rate of climb/combat altitude ^{2/} (fpm/ft) ...	2100/5000	2000/5000	1620/5000	....
Combat ceiling (500 fpm) ^{2/} (ft) ...	25,200	24,300	20,400	....
Rate of climb at SL ^{2/} (fpm) ...	2880	2780	2320	....
Max speed at SL ^{2/} (kn) ...	255	252	239	....
Max speed/altitude ^{2/} (kn/ft) ...	256/10,000	253/10,000	240/5000	....
LANDING WEIGHT (10 percent internal fuel) (lb) ...	10,945	11,206	12,460	....
Fuel (lb) ...	193	193	193	....
Stall speed-power off ^{4/} /approach power ^{5/} (kn) ...	68/54	69/55	72/58	
Landing distance to clear 50-ft obstacle (ft) ...	850 ^{7/}	870 ^{7/}	1335 ^{8/}	

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1-91. Loading and Performance - Typical Mission, OV-1C (Mohawk) (CONT).

¹/Normal rated power.

²/Military rated power.

³/See notes on mission specifications.

⁴/Flight idle power, propeller control at max rpm.

⁵/Power for level flight at 120 percent of stall speed, power off, propeller control at max rpm.

⁶/Takeoff distances are based on takeoff and obstacle speed equal to 120 percent of power-off stall speed in takeoff configuration.

⁷/Landing distance is based on approach speed equal to 110 percent of landing stall speed with rate of sink equal to 14 fps.

⁸/Landing distance is based on approach speed equal to 110 percent of landing stall speed, power off, with rate of sink equal to 8 fps.

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1-92. Performance Notes, OV-1C (Mohawk).

TACTICAL AIR OBSERVATION MISSION AND NIGHT PHOTOGRAPHY (Columns 1, 3, and 5, paragraph 1-92).

Warm up, taxi, take off, climb on course to 5000 feet at normal rated power, and cruise at 200 knots at 5000 feet until all but reserve fuel is consumed. Range-free allowances are 5 minutes for warmup taxi and takeoff, plus 10 percent of initial internal fuel for reserve.

FERRY MISSION (Column 7, paragraph 1-92).

Warm up, taxi, take off, climb on course to altitude for maximum range at normal rated power, cruise at altitude and velocity for maximum range, and drop external fuel tanks when empty. Range-free allowances are 5 minutes for warmup, taxi, and take-off, plus 10 percent of initial internal fuel for reserve.

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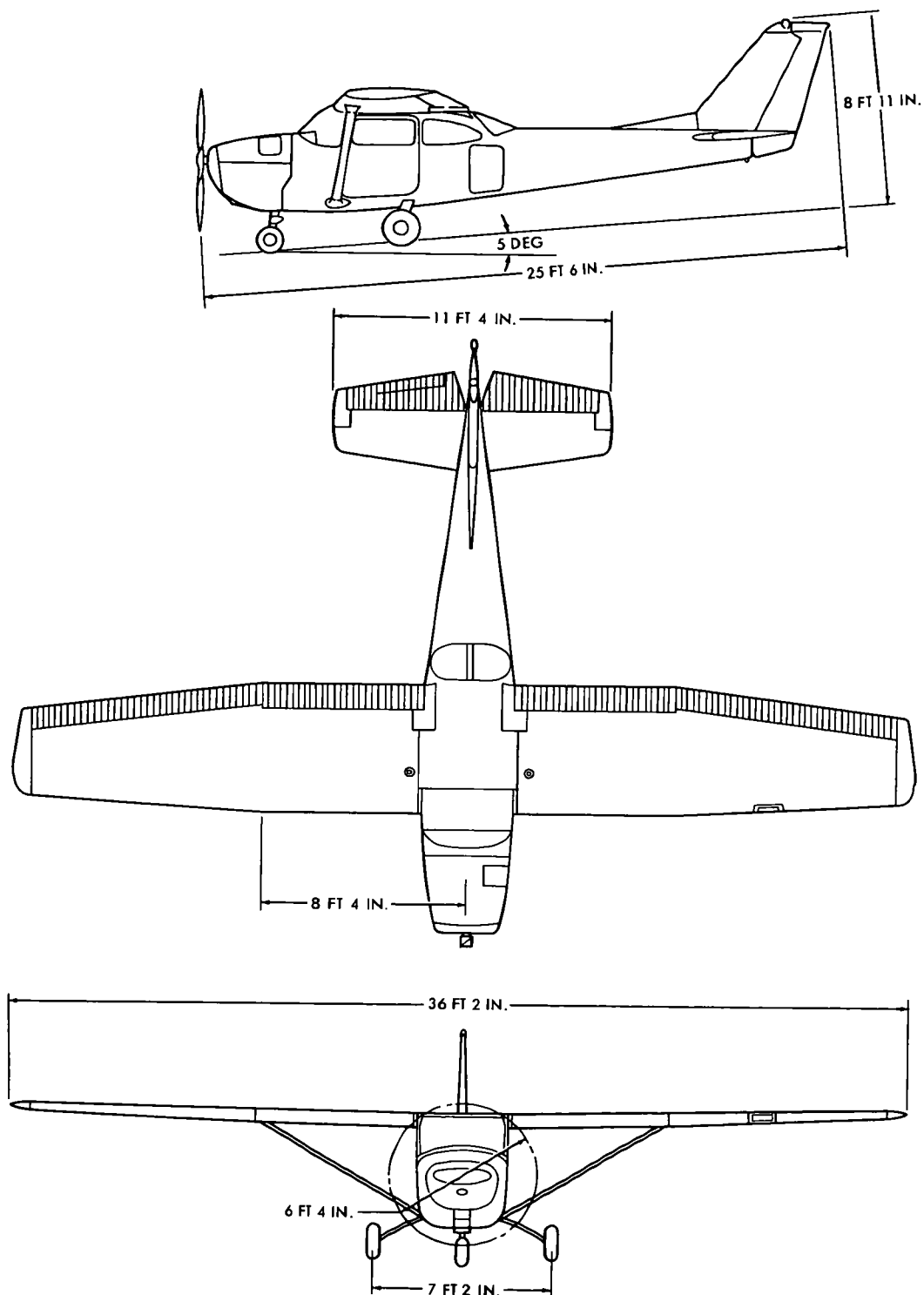
1-93. OV-1D (Mohawk) Characteristics.

POWERPLANT				MISSION AND DESCRIPTION		WEIGHTS		
							LB	L.F
No. & Model	(2)	T53-L-701		The primary mission of the OV-1D is to perform either infrared (IR) reconnaissance or side looking airborne radar (SLAR) missions. The SLAR and IR are interchangeable. In addition it is capable of performing photographic missions, visual reconnaissance and observation, artillery gun fire spotting, air control, and radiological monitoring. The OV-1D is a two place, twin turboprop aircraft capable of operating from small fields and unimproved runways. Design features include a midwing, three-tail configuration of semimonocoque construction equipped with wide span flaps. The crew of two are seated side-by-side within a bubbled enclosure at the extreme forward end of the fuselage. The OV-1D is equipped with three independent photographic systems, all of which have automatic exposure controls and can be operated by either the pilot or observer. External provisions are incorporated to carry two 150 gallon fuel tanks, two ECM pods or LS 59A photo flasher.		Empty	11,896	
Mfr.		Lycoming				Basic	12,104	
						Design	15,421	4.0/2.0
Type		Free Power				Combat		
		Turbine				(IR)	15,497	
						(SLAR)	15,647	
						Normal		
Engine Spec Nr		104.39				Take-Off	15,421	
						Max		
Red. Gear Ratio		12.38				Take-Off	18,337	
						Max		
Prop Mfg		Ham Std				Landing	14,315	
Blade Design Nr		5157C-6						
No. of Blades		3				FUEL & OIL		
Prop Dia.		10 ft.				Fuel		
				Grade	JP-4/5			
				Spec	MIL-F-5624			
				No. Tanks				
				Fuselage	(1)	297 gal		
				External	(2)	150 gal		
				Total Qty		597 gal		
				Oil:				
				Spec	MIL-L-23699			
				Qty	5 gallon			
				AVIONICS				
				Refer to Chapter 2				
				DIMENSIONS				
				Wing:				
				Area		360 sq ft		
				Span		48 ft		
				MAC		98 in		
				Length		41 ft 3.65 in		
				Height		12 ft 8 in		
				Tread		9 ft 2 in		



Figure 1-51. T-41B (Mescalero)

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Figure 1-52. Principal dimensions, T41B (Mescalero)

1-94. T-41B (Mescalero) Characteristics.

POWERPLANT	MISSION AND DESCRIPTION		WEIGHTS
No. & model (1) IO-360D Mfr..... Continental Prop type..... CS, VP Prop dia 6 ft, 4 in.	Mfr's Model: Cessna 172		Empty LB 1545 Utility 2200 Normal 2500
ENGINE RATING	The T-41B is an interim inventory fill to replace O-1 drawdown pending availability of the OH-6A. Missions include primary and advanced contact trainer and installation support roles. The T-41B will be used in two configurations as follows: Utility mission – FAA normal category to include aircraft empty weight, including electronics, crew of two (instructor and student), at 200 pounds each, and fuel for endurance for 4.5 hours at 110 knots. Normal mission – FAA normal category to include aircraft empty weight, including electronics, crew of one, two passengers, at 200 pounds each, and fuel for endurance for 4.5 hours at 110 knots.		FUEL AND OIL
To be published.			Fuel: Qty 42 gal
DIMENSIONS			AVIONICS
Wing span..... 36 ft, 2 in. Height 8 ft, 11 in. Tread 7 ft, 2 in.			Refer to chapter 2.
	DEVELOPMENT		ARMAMENT
	Date of contract 8 August 1966 First Production acft October 1966		None
	FEATURES	PERSONNEL	
	All metal. High wing. Fixed tricycle landing gear. Dual side-by-side controls.	Crew 2 Instructor pilot 1 Student pilot 1 or Crew 1 Passengers 2	

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1-95. Performance - Typical Mission, T-41B (Mescalero).

Range (4.5 hours)	(mi) . . .	595
Cruise speed $\frac{1}{2}$	(mph) . . .	130
Max speed	(mph) . . .	138
Takeoff distance	(ft) . . .	865
Landing distance	(ft) . . .	520
Rate of climb	(fpm) . . .	645
Service ceiling	(ft) . . .	13,100
$\frac{1}{2}$ 75-percent power at 7000 feet.		

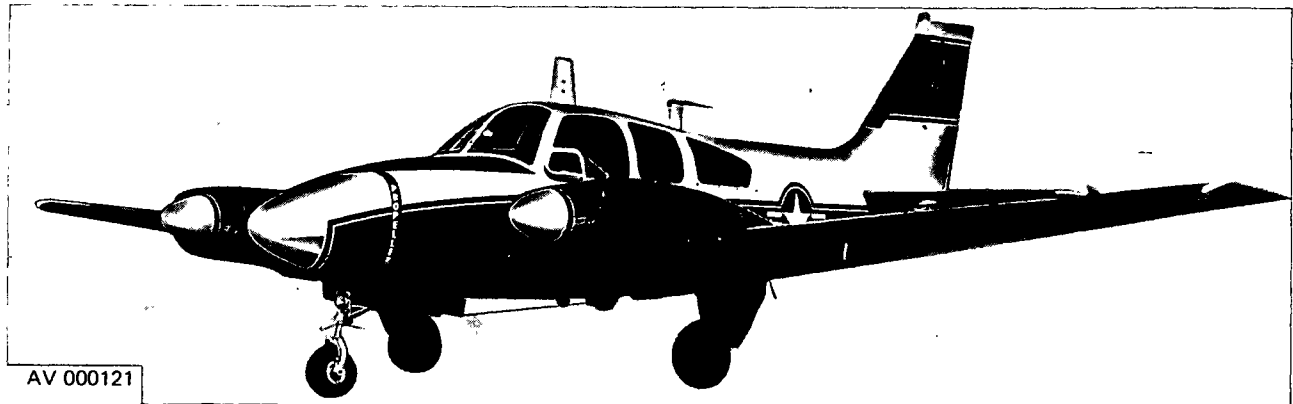
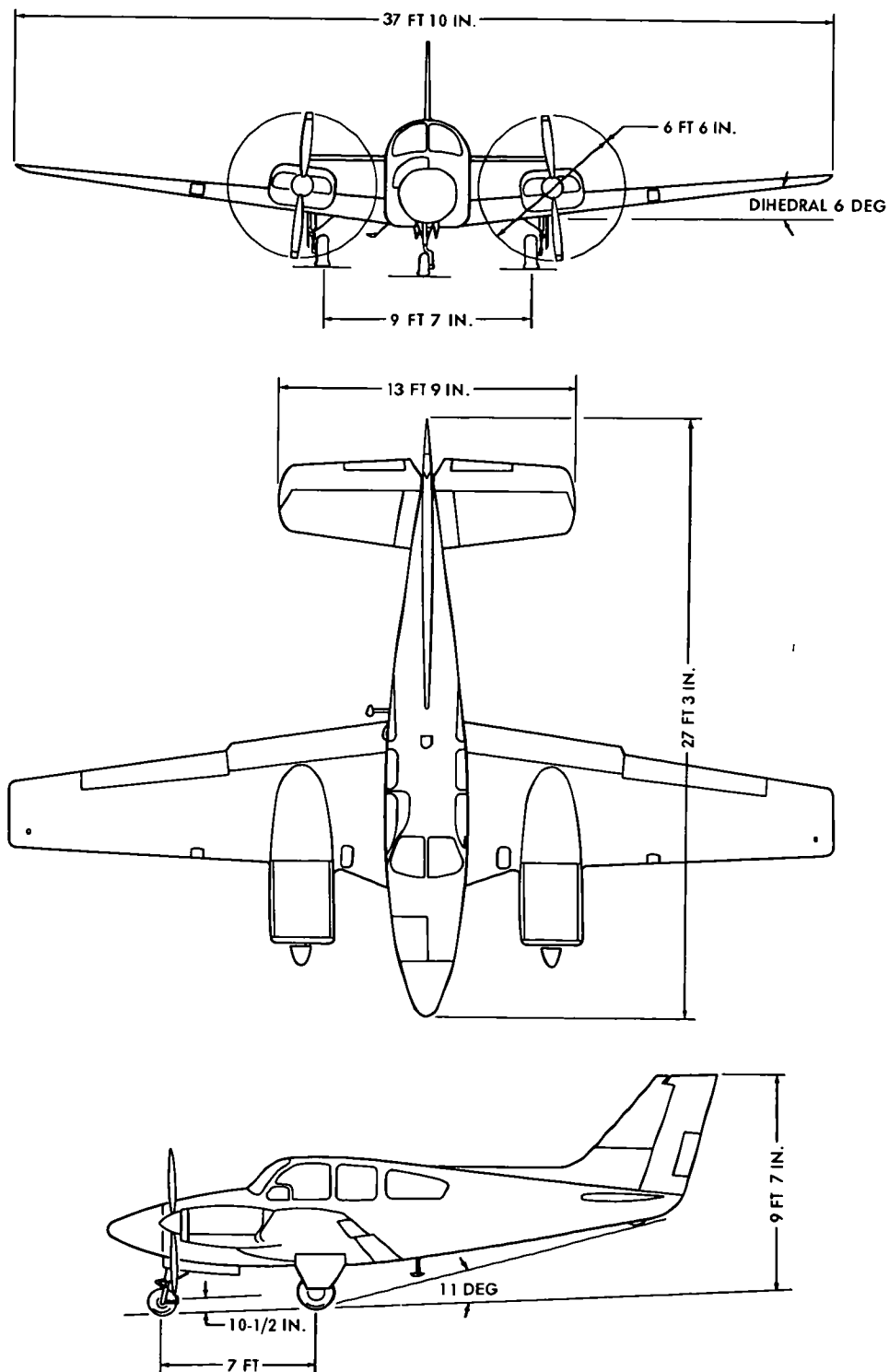


Figure 1-53. T-42A (Cochise)

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Figure 1-54. Principal dimensions, T-42A (Cochise)

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1-97. Loading and Performance - Typical Mission, T-42A (Cochise).

TAKEOFF LOADING CONDITIONS		BASIC MISSION
Takeoff Weight	(LB)	5,100
Fuel	(LB)	852
Payload	(LB)	-
Wing Loading	(Lbs/Sq Ft) ...	25.5
Stall Speed <u>1</u> /	(Kn)	66
Stall Speed <u>2</u> /	(Kn)	73.5
Takeoff Run at SL	(Ft)	910
Takeoff Run to Clear 50 ft	(Ft)	1,255
Max Speed SL	(Kn)	205
Rate Climb SL	(FPM)	1,670
Time SL to 10,000 ft	(Min)	8
Service Ceiling (100 FPM)	(Ft)	1,970
LANDING WEIGHT		
(10% Fuel)		4,333
Fuel	(Lb)	85
Ground Roll At SL	(Ft)	997
Landing Distance to Clear 50 Ft. Obstacle	(Ft)	1,534

1/ Zero Thrust, Flaps 28°, and Gear Down2/ Power OFF, Flaps Up, and Gear Up

CHAPTER 2

LOGISTICS AND MATERIEL

Section I. MAXIMUM ALLOWABLE OPERATING TIME (MAOT) (MAJOR COMPONENTS)

2-1. Major Components.

TYPE OF AIRCRAFT	MAJOR COMPONENT	MAOT	LIFE EXPECTANCY
AH-1G	Engine (T53-L-13)	6001/	Indefinite
	Engine (T53-L-13A)	1200	Indefinite
	Engine (T53-L-13B)	1200	Indefinite
	Main Rotor Blade Assembly	1100	1100
	Main Rotor Hub Assembly	1100	Indefinite
	Yoke	3300	3300
	Extension Assembly	3300	3300
	Retention Straps	2200	2200
	Pin	2200	2200
	Fitting	2200	2200
	Nut	2200	2200
	Transmission Assembly	1100	Indefinite
	Main Input Quill Assembly	1100	Indefinite
	Mast Assembly	1100	Indefinite
	Mast Bearing	1100	1100
	Blade Assembly, Tail Rotor	1100	1100
	Tail Rotor Hub Assembly	1100	1100
	Grip	1100	1100
	Yoke	1100	1100

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2-1. Major Components (CONT).

TYPE OF AIRCRAFT	MAJOR COMPONENT	MAOT	LIFE EXPECTANCY
AH-1G (Cont) . . .	Forty-two degree gearbox	1500	Indefinite
	Ninety degree gearbox	1100	Indefinite
	Swashplate and Support Assembly	1100	Indefinite
	Outer Ring	3300	3300
	Inner Ring	3300	3300
	Scissors and Sleeve Assembly	1100	1100
	Scissors Assembly	3300	3300
	Drive Link:		
	P/N 209-010-408-1	400	400
	P/N 209-010-408-5	25	25
	Engine Mount Trunnion:	300	300
	P/N 206-060-113-1		
	Servo Cylinder Assembly	3300	Indefinite
	Cylinder	3300	3300
	Bearing Housing	3300	3300
CH-34C	Engine (R-1820-84C)	1000	Indefinite
	Main rotor head	1100	Indefinite
	Main transmission	1100	Indefinite
	Intermediate gearbox	1300	Indefinite
	Tail rotor gearbox	1300	Indefinite
	Hydro-mechanical clutch	800	Indefinite
	Main rotor blade	2500	2500

2-1. Major Components (CONT).

TYPE OF AIRCRAFT	MAJOR COMPONENT	MAOT	LIFE EXPECTANCY
CH-47A	Engine (T55-L-7)	1800	Indefinite
	Forward rotor head	2400	Indefinite
	Aft rotor head	2400	Indefinite
	Forward transmission	1200 $\frac{1}{/}$	Indefinite
	Aft transmission	1200 $\frac{1}{/}$	Indefinite
	Combining transmission	1200 $\frac{1}{/}$	Indefinite
	Engine transmission	1200 $\frac{1}{/}$	Indefinite
	Rotor blades, forward	3600	3600
	Rotor blades, aft	2400	2400
CH-47B	Engine (T55-L-7C)	1800	Indefinite
	Forward rotor head	1200	Indefinite
	Aft rotor head	1200	Indefinite
	Forward transmission	1200 $\frac{1}{/}$	Indefinite
	Aft transmission	1200 $\frac{1}{/}$	Indefinite
	Combining transmission	1200 $\frac{1}{/}$	Indefinite
	Engine transmission	1200 $\frac{1}{/}$	Indefinite
	Rotor blades, forward	6000 $\frac{2}{/}$	6000 $\frac{2}{/}$
	Rotor blades, aft	4000 $\frac{2}{/}$	4000 $\frac{2}{/}$
CH-47C	Engine (T55-L-11)	300	Indefinite
	Forward rotor head	1200	Indefinite
	Aft rotor head	1200	Indefinite
	Forward transmission	1200 $\frac{1}{/}$	Indefinite
	Aft transmission	1200 $\frac{1}{/}$	Indefinite
	Combining transmission	1200 $\frac{1}{/}$	Indefinite

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2-1. Major Components (CONT).

TYPE OF AIRCRAFT	MAJOR COMPONENT	MAOT	LIFE EXPECTANCY
CH-47C (Cont) . .	Engine transmission	900 <u>1/</u>	Indefinite
	Rotor blades, forward	6000 <u>2/</u>	6000 <u>2/</u>
	Rotor blades, aft	4000 <u>2/</u>	4000 <u>2/</u>
CH-54A	Engine (T73-P-1)	1000	Indefinite
	Main rotor head	500	Indefinite
	Tail rotor head	800	Indefinite
	Main gearbox	1000	Indefinite
	Intermediate gearbox	On cond	Indefinite
	Main rotor servo and control arm assembly	1000	Indefinite
	AFCS servo	1000	Indefinite
	APP clutch	On cond	Indefinite
	Main blades	5000	5000
	Tail rotor gearbox and servo assembly	1200	Indefinite
	Fuel control (T73-P-1)	1000	Indefinite
	Auxiliary power unit	On cond	Indefinite
CH-54B	Engine (T73-P-700)	800	Indefinite
	Main rotor head	800	Indefinite
	Main rotor servo	1200	Indefinite
	AFCS servo	1200	Indefinite
	Tail rotor assembly	800	Indefinite
	Tail rotor gearbox and servo assembly	1200	Indefinite
	Intermediate gearbox	1200	Indefinite
	Main gearbox	1000	Indefinite
	Main rotor dampers	7200	7200

2-1. Major Components (CONT).

TYPE OF AIRCRAFT	MAJOR COMPONENT	MAOT	LIFE EXPECTANCY
CH-54B (Cont) . .	Main rotor blade	2500	2500
	Tail rotor blade	1600	1600
	Main cargo hoist	240	Indefinite
OH-6A	Engine (T63-A-5A)	750	Indefinite
	Fuel control	750	Indefinite
	N ₂ governor	750	Indefinite
	Main transmission	750	Indefinite
	Main rotor swashplate bearing	1200	Indefinite
	Main rotor hub	1200	5714
	Tail rotor transmission	750	Indefinite
	Tail rotor assembly	600	Indefinite
	Overrunning clutch	1200	Indefinite
	Main rotor blades	NA	1655
	Main rotor drive shaft	NA	1990
OH-13H	Engine (O-435-23C)	1500	Indefinite
OH-13S/T	Engine (O-435-25A)	1200	Indefinite
OH-13 (all)	Main transmission	On cond	Indefinite
	Tail rotor gearbox	On cond	Indefinite
OH-23D	Engine (O-435-23C)	1500	Indefinite
	Main transmission	1500	Indefinite
	Cooling fan gearbox:		
	P/N 74180	1000	Indefinite
	P/N 74155	550	Indefinite
	Tail rotor gearbox	2000	Indefinite

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2-1. Major Components (CONT).

TYPE OF AIRCRAFT	MAJOR COMPONENT	MAOT	LIFE EXPECTANCY
OH-23D (Cont) . .	Main rotor head	2500	2500
	Main rotor blades	1500	5000
	Tail rotor blades	5400	5400
OH-23F/G	Engine (0-540-9A)	900	Indefinite
	Main transmission	1500	Indefinite
	Cooling fan gearbox	1000	Indefinite
	Tail rotor gearbox	2000	Indefinite
	Main rotor head	2500	2500
	Main rotor blades assembly	1500	5000
	Tail rotor blades assembly	5400	5400
OH-58A	Engine (T63-A-700)	750	Indefinite
	Main transmission	1200	Indefinite
	Swashplate and support assembly	1200	Indefinite
	Main rotor swashplate bearing	NA	1200
	Main rotor hub	1200	Indefinite
	Grip	NA	4800
	Strap assembly	NA	1200
	Pin, strap retaining	NA	1200
	Fitting assembly	NA	1200
	Main rotor blades	NA	1200
	Mast assembly	1200	Indefinite
	Mast	NA	1200
	Tail rotor transmission	1200	Indefinite

2-1. Major Components (CONT).

TYPE OF AIRCRAFT	MAJOR COMPONENT	MAOT	LIFE EXPECTANCY
OH-58A (Cont) . .	Tail rotor hub	1200	Indefinite
	Blade assembly	NA	1200
	Trunnion assembly	NA	2400
	Freewheeling assembly	1200	Indefinite
	Drive shaft assembly, main	1200	Indefinite
	Pylon isolation mount	NA	1200
	Tail rotor drive shaft installation	1200	Indefinite
TH-55A	Tail rotor retention straps	2800	2800
	Main rotor blades	1366	1366
	Horiz stabilizer assembly	3070	3070
	Tail rotor drive shaft	3000	3000
	Tail rotor drive shaft driven spline	3000	3000
	Tail rotor gearbox input shaft	3000	3000
	Main rotor gearbox pinion assembly	3000	3000
	Lower pulley coupling shaft	1500	1500
	Tail boom assembly	17,370	17,370
	Engine	1600	Indefinite
	Tail rotor gearbox	1800	Indefinite
UH-1B	Engine (T53-L-5/9/9A/11/11A,B)	1200	Indefinite
	Engine (T53-L-11C,D)	1800	Indefinite
	Main rotor hub	1100	Indefinite
	Main transmission	1100	Indefinite
	Ninety-degree gearbox	1100	Indefinite

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2-1. Major Components (CONT).

TYPE OF AIRCRAFT	MAJOR COMPONENT	MAOT	LIFE EXPECTANCY
UH-1B (Cont) . . .	Forty-two degree gearbox	1500	Indefinite
	Main rotor blades	1000	1000
	Main rotor mast	1100	Indefinite
	Tail rotor blades and hub	1100	1100
UH-1C	Engine (T53-L5/9/9A/11/11A,B)	1200	Indefinite
	Engine (T53-L-11C,D)	1800	Indefinite
	Main rotor hub	1100	Indefinite
	Main transmission	1100	Indefinite
	Main rotor mast	1100	Indefinite
	Main rotor blades	1100	Indefinite
	Forty-two degree gearbox	1500	Indefinite
	Ninety-degree gearbox	1100	Indefinite
	Swashplate and support	1100	Indefinite
	Scissors and sleeve assembly	1100	Indefinite
	Stabilizer bar	2200	2200
UH-1D	Engine (T53-L-9/9A/11 only)	1200	Indefinite
	Engine (T53-L-5/11A,B)	1200	Indefinite
	Engine (T53-L-11C,D)	1800	Indefinite
UH-1H	Engine (T53-L-13 only)	600	Indefinite
	Engine (T53-L-13A,B)	1200	Indefinite
	Main rotor hub	1100	Indefinite
	Main transmission	1100	Indefinite
	Main rotor mast	1100	Indefinite
	Forty-two degree gearbox	1500	Indefinite

2-1. Major Components (CONT).

TYPE OF AIRCRAFT	MAJOR COMPONENT	MAOT	LIFE EXPECTANCY
UH-1H (Cont) ..	Ninety degree gearbox	1100	Indefinite
	Main rotor blades: 48 foot	2500	2500
	Tail rotor blades and hub	1100	1100
O-1/E/G	Engine (0470-11B)	1800	Indefinite
O-1D	Engine (0470-15)	1800	Indefinite
	Propeller: P/N 2A36CIUS90MO	1800	Indefinite
OV-1A/B/C/D ..	Engine (T53-L-7)	1200	Indefinite
	(T53-L-7A)	1800	Indefinite
	(T53-L-15)	1200	Indefinite
	(T53-L-701)	1200	Indefinite
	Propeller	1200	Indefinite
	Propeller control	1200	Indefinite
U-1A	Engine (R-1340-59/61)	1300	Indefinite
	Propeller	1700	Indefinite
	Governor	1100	Indefinite
U-6A	Engine (R-985-AN-14B/39/39A)	1400	Indefinite
	Propeller:		
	Modified	1400	Indefinite
	Unmodified	825	Indefinite
	Governor	1400	Indefinite
	Wing strut	6000	6000

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2-1. Major Components (CONT).

TYPE OF AIRCRAFT	MAJOR COMPONENT	MAOT	LIFE EXPECTANCY
U-8D/G	Engine (O-480-1B)	2000	Indefinite
	Propeller	2000	Indefinite
U-8F	Engine (O-480-3A)	2000	Indefinite
	Propeller	2000	Indefinite
U-21A	Engine (T47-CP-700)	2100 ^{3/}	Indefinite
	Propeller: P/N HCB3TN3BT10173E8	1500	Indefinite

2-1. Major Components (CONT).

NOTE: MAOT (Maximum allowable operating time) is the maximum operating time, interval or usage increment limit at which it is mandatory that a component will be removed from a service aircraft. (When used in reference to overhaul components, MAOT is the same as the term "time between overhaul" (TBO) previously used.)

NOTE: MTR (meantime to removal) is the average serviceable life of an item. The MTR is substantially less than the MAOT and varies under different operating conditions (i.e., erosion of engine turbine blades due to ingestion of dust in RVN). Refer to AVSCOM, ATTN: AMSAV-R-E for MTR data.

NOTE: This manual is a general guide. Check should be made with the most current publication for the specific MAOT.

1/Component MAOT varies according to part numbers. MAOT shown is for part with the highest value. All old part numbers will be modified to the high time configurations.

2/Component MAOT and/or life expectancy varies with different part numbers. Life shown is for the part with the highest value.

3/TB 55-1510-209-20/2 goal is 2400 hours.

Section II. AIRCRAFT EQUIPMENT**2-2. Avionics and Surveillance Equipment Configurations.***

The aircraft configurations listed depict the approved installation requirements for avionics and surveillance equipments in Army aircraft. The aircraft

presently in active Army use with configurations other than those presented are being scheduled for retrofit as applicable. Further details on Army aircraft configurations and the associated ground avionics systems and maintenance support equipments are available in the US Army Standard Avionics and Performance Configurations Five-Year Requirement Plan.

*Source: SELAE-E

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2-2. Avionics and Surveillance Equipment Configurations (CONT)

AH-1G		AH-1G																		
TYPE NUMBER	FUNCTION/NOUN																			
AM-3209()/ASN	Servo Amplifier	1																		
AN/APX-72	IFF Transponder	1																		
AN/ARC-51BX	UHF-AM Radio Set	1																		
AN/ARC-54 or	VHF-FM Radio Set	1/1																		
AN/ARC-131	VHF-FM Radio Set	1/1																		
AN/ARC-134	VHF-AM Radio Set	1																		
AN/ARN-83	ADF Receiver	1																		
AN/ASN-43	Gyro Compass	1																		
AN/ASW-() (BHC#570A)	SAS	1																		
AS-2285()/ARC	VHF-FM Comm Ant	1																		
AT-884()/APX	IFF Antenna	1																		
AT-1108()/ARC	UHF-VHF Comm Ant	1																		
BB-649()/A	Battery	1																		
C-1611()/AIC	Intercom Set	2																		
C-8157()/ARC	Control-Ind Ass'y	1																		
CN-1314()/A	Gyroscope	1																		
ID-48()/ARN	Course Indicator	1																		
ID-250()/ARN	Course Indicator	1																		
ID-998()/ASN	RMI Indicator	1																		
KIT-1A/TSEC	IFF Computer	CPO																		
MC-1	Rate Switch Gyro	1																		
MD-736()/A	Signal Discriminator	2																		
MT-3802()/ARC	Mount (KY-28)	1																		
PP-6508()/U	Static Inverter	1																		
PU-543()/A	Inverter	1																		

CPO (Complete Provisions Only) Racks, mounting, flanges, wiring, etc.

2-2. Avionics and Surveillance Equipment Configurations (CONT).

AH-1G		AH-1G										
TYPE NUMBER	FUNCTION/NOUN											
TS-1843()/APX	IFF Test Set	² /CPO										
TSEC/KY-28	Comm Security Set	CPO										

¹/Either the AN/ARC-54 or AN/ARC-131 may be installed but not both.

²/Will be installed upon availability of equipment.

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

CH-34C		CH-34C																	
TYPE NUMBER	FUNCTION/NOUN																		
AN/APX-44	IFF Transponder Set	² /CPO																	
AN/ARA-31	FM Antenna Group	1																	
AN/ARC-44	VHF-FM Radio Set	1																	
AN/ARC-55	UHF-AM Radio Set	1																	
AN/ARC-73	VHF-AM Radio Set	¹ /CPO																	
AN/ARC-102	HF-AM Radio Set	² /CPO																	
AN/ARN-6 or 59	ADF Receiver	1																	
AN/ARN-12 or 32	Market Beacon Receiver	1																	
AN/ARN-30()	VOR Receiver	1																	
AN/ASN-23	Auto Pilot	1																	
AN-3150-2	Battery	1																	
AN-3533	Inverter 500VA	2																	
AT-450/ARC	UHF Comm Antenna	1																	
AT-640/ARN	Marker Beacon Antenna	1																	
CU-1658/A	HF Antenna Coupler	² /CPO																	
J-2	Gyro Compass	1																	
MT-3772/A	Mount	² /CPO																	
MX-1646/AIC	Headset Adapter	2																	

¹/Installed in selected area when installed, VHF/AM is removed²/Installed when required to accomplish mission

2-2. Avionics and Surveillance Equipment Configurations (CONT).

CH-47		CH-47A (FY-61)	CH-47A (FY-61-62)	CH-47A (FY-64)	CH-47A (66-066-66-086)	CH-47A (66-087-66-19097)	CH-47B (66-19098-67-18493)	CH-47C (67-18494-67-18551)	CH-47C (68-15810-68-15857)	CH-47C (68-15858-68-15869) (68-15990-68-16022) (69-17100-69-17126)	CH-47C (FY-70)
TYPE NUMBER	FUNCTION/NOUN										
AM-3209()/ASN	Servo Amplifier	1	1	1	1	1	1	1	1	1	1
AN/APX-44	IFF Transponder	1	1	1	1	1	1				
AN/APX-72	IFF Transponder			%CPO	%CPO	%CPO	%CPO	1	1	1	1
AN/ARA-31	FM Antenna GP	1									
AN/ARC-44	VHF-FM Radio Set	1									
AN/ARC-51BX	UHF-AM Radio Set		1	1	1	1	1	1	1	1	1
AN/ARC-54	VHF-FM Radio Set		1	1	1	1	1	1	1	1	
AN/ARC-55	UHF- AM Radio Set	1									
AN/ARC-73	VHF-AM Radio Set	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO		
AN/ARC-102	HF-AM Radio Set	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO
AN/ARC-131	VHF-FM Radio Set										1
AN/ARC-134	VHF-AM Radio Set								1	1	1
AN/ARN-30E	VOR Receiver	1	1	1	1						
AN/ARN-59	ADF Receiver #1	1	1	1	1						
AN/ARN-59	ADF Receiver #2	CPO									
AN/ARN-82	VOR Receiver					1	1	1	1	1	1
AN/ARN-83	ADF Receiver					1	1	1	1	1	1
AN/ASN-43	Gyro Compass				1	1	1	1	1	1	1
AN/ASN-72	Decca Nav Sys	CPO	CPO	CPO	CPO	CPO	CPO	CPO	1/2CPO		
AS-580()/ARN-30	VOR Antenna	1	1	1	1						
AS-1703()/AR	FM Comm Antenna		1	1	1	1	1	1	1	1	1
AS-1869()/ARN	ADF Sense Antenna					1	1	1	1	1	1
AS-1870()/ARN	ADF Sense Antenna	1	1	1	1						
AS-1922()/ARC	FM Homing Antenna		1	1	1	1	1	1	1	1	1
AT-450()/ARC	UHF Comm Antenna	1									

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

CH-47		CH-47A (FY-61)	CH-47A (FY-61-62)	CH-47A (FY-64)	CH-47A (66-066-66-086)	CH-47A (66-087-66-19097)	CH-47B (66-19098-67-18493)	CH-47C (67-18494-67-18551)	CH-47C (68-15810-68-15857)	CH-47C (68-15858-68-15869) (68-15990-68-16022) (69-17100-69-17126)	CH-47C (FY-70)
TYPE NUMBER	FUNCTION/NOUN										
AT-640()/ARN	Marker Beacon Ant	1	1	1	1	1	1	1	1	1	1
AT-884()/APX	IFF Antenna	1	1	1	1	1	1	1	1	1	1
AT-1108()/ARC	UHF-VHF Comm Ant		1	1	1	1	1	1	1	1	1
BB-432()/A	Battery	1	1	1	1	1	1	1	1	1	1
C-1611()/AIC	Intercom Set	6	6	6	6	6	6	6	6	6	6
C-4209()/ARC	Control (T-366()/ARC)	1	1								
C-8157()/ARC	Control Ind. Ass'y		1	1	1	1	1	1	1	1	1
CN-811()/ASN(SBU-6A)	Displacement Gyro	2	2	2	2	2	2	2	2	2	2
CU-942()/ARC	FM Antenna Coupler		1	1	1	1	1	1	1	1	1
CU-991()/AR	HF Antenna Coupler	CPO	CPO	CPO	CPO	CPO	CPO	CPO	² /CPO		
CU-1658()/A	HF Antenna Coupler								² /CPO	CPO	CPO
CV- 1275()/ARN	RMI Converter	1	1	1	1						
DMN 4-4.1	VOR Antenna					2	2	2	2	2	2
DY-86()/ARN-30 or	Dynamotor										
PP-2792()/ARN-30D	Power Supply	1	1	1	1	1	1	1			
F-726()/AR	Filter	1	1	1	1	1	1	1			
ID-250()/ARN	Course Indicator	1	1	1	1	1	1	1	1	1	1
ID-453()/ARN-30	Course Indicator			1							
ID- 998()/ASN	RMI Indicator	1	1	1	1	1	1	1	1	1	1
IN-14	Course Indicator	1	1								
J-2	Gyro Compass	1	1	1							
Kit-1A/TSEC	IFF Computer			CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO
M-40A	Mount (CV-1275()/ARN)	1	1	1	1						
MD-736()/A	Signal Discriminator		3	3	3	3	3	3	3	3	3
MT-1142()/ARC	Mount (T-366()/ARC)	1	1	1							
MT-1719()/AR	Mount (CU-991()/AR)	1	CPO	CPO	CPO	CPO	CPO	CPO	² /CPO		

2-2. Avionics and Surveillance Equipment Configurations (CONT).

CH-47		CH-47A (FY-61)	CH-47A (FY-61-62)	CH-47A (FY-64)	CH-47A (66-066-66-086)	CH-47A (66-087-66-19097)	CH-47B (66-19098-67-18493)	CH-47C (67-18494-67-18551)	CH-47C (68-15810-68-15857)	CH-47C (68-15858-68-15869) (68-15990-68-16022) (69-17100-69-17126)	CH-47C (FY-70)
TYPE NUMBER	FUNCTION/NOUN										
MT-2292()/ARN	Mount (R-1041()/ARN)	CPO	1	1	1	1	1	1	1	1	1
MT-2641()/ARC-94	Mount (AN/ARC-102)									³ / ₁	1
MT-3772()/A	Mount (CU-1658A/A)								² / _{CPO}	CPO	CPO
MT-3802()/ARC	Mount (KY-28)		1	1	1	1	1	1	1	1	1
R-1041()/ARN	Marker Beacon Receiver	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO
SI-07F	Filter	6	6	6	6	6	6	6	6	6	6
T-366()/ARC	VHF-AM Transmitter	1	1								
TSEC/KY-28	Comm Security Set		CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO
TS-1843()APX	IFF Test Set		CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO
114E 2186-16 or	Speed Trim Amplifier	⁴ / ₁	⁴ / ₁	⁴ / ₁							
114E 2186-19	Speed Trim Amplifier	⁴ / ₁	⁴ / ₁	⁴ / ₁	1	1					
114E 2186-23 or	Speed Trim Amplifier						1				
114E 2186-26	Speed Trim Amplifier						1	1	1		
114E 2186-30	Speed Trim Amplifier									1	1
114E 3030-40 or	SAS Amplifier	⁵ / ₂	⁵ / ₂								
114E 3030-42 or	SAS Amplifier	⁵ / ₂	⁵ / ₂	⁵ / ₂							
114E 3030-43	SAS Amplifier	⁵ / ₂	⁵ / ₂	⁵ / ₂	⁵ / ₂	2					
114E 3030-47	SAS Amplifier						2	2	2		
114E 3030-49	SAS Amplifier									2	2
1560-CH-47-209-13	Control			1	1						

¹/Installation of complete provisions was discontinued after S/N 68-15814.

²/Provisions for CU-1658A/A and MT- 3772A/A were installed in production starting with S/N 68-15835. Prior aircraft have provisions for CU-991()/AR and MT-1719()/AR.

³/Installed in production, S/N 68-15860 and subsequent.

⁴/Vertol P/N 114E2186-16 or 114E 2186-19 may be used; however, the former is the preferred item.

⁵/Vertol P/N 114E 3030-40 is only authorized when small landing gear is installed.

⁶/Will be installed when available, When AN/APX-72 is installed the AN/APX-44 is removed.

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

CH-54		CH-54A (66-18408-66-18413)	CH-54A (67-18414-66-18431)	CH-54A (68-18432-68-18461)	CH-54A (69-18464-69-18471)	CH-54B (69-18462-69-18463)	CH-54B (69-18472-69-18484)					
TYPE NUMBER	FUNCTION/NOUN											
AM-3209()/ASN	Servo Amplifier	1	1	1	1	1						
*AM-6279()/ASW	AFCS Amplifier					1						
*AM-6280()/ASW	AFCS Amplifier					1						
AN/APX-44	IFF Transponder	1	1/4									
AN/APX-72	IFF Transponder		1/CPO	1	1	1						
AN/ARC-51BX	UHF-AM Radio Set	1	1	1	1	1						
AN/ARC-54	VHF-FM Radio Set	2/1	2/1	2/1								
AN/ARC-73	VHF-AM Radio Set	CPO										
AN/ARC-102	HF- AM Radio Set	CPO	CPO	CPO	CPO	CPO						
AN/ARC-131	VHF-FM Radio Set	2/1	2/1	2/1	1	1						
AN/ARC-134	VHF-AM Radio Set		1	1	1	1						
AN/ARN-82	VOR Receiver	1	1	1	1	1						
AN/ARN-83	ADF Receiver	1	1	1	1	1						
AN/ASH-19	Voice Warning Set				1	1						
AN/ASH-23	Voice Warning-Recorder				1	1						
AN/ASN-43	Gyro Compass	1	1	1	1	1						
AN/ASW-29	Flight Control System	1	1	1	1							
AS-1304()/ARN	VOR Antenna	1	1	1	1	1						
AS-1703()/AR	FM Comm Antenna	1	1	1	1	1						
AS-1922()/ARC	FM Homing Antenna	1	1	1	1	1						
AT-884()/APX	IFF Antenna	1	1	1	1	1						
AT-1108()/ARC	UHF/VHF Antenna	1	1	1	1	1						
BB-434()/A	Battery	1	1	1	1	1						
C-1611()/AIC	Intercom Set	5	5	5	5	5						
C-4209()/ARC	Control (T-366()/ARC)	1										

2-2. Avionics and Surveillance Equipment Configurations (CONT).

CH-54		CH-54A (66-18408-66-18413)	CH-54A (67-18414-66-18431)	CH-54A (68-18432-68-18461)	CH-54A (69-18464-69-18471)	CH-54B (69-18462-69-18463) (69-18472-69-18484)					
TYPE NUMBER	FUNCTION/NOUN										
*C- 7266()/ASW-29	Control (AFCS)					1					
*C-7269()/ASW	Control (AN/ASW-29)	1	1	1	1						
C-8157()/ARC	Control-Ind. Ass'y	1	1	1	1	1					
*C-8476()/ASW	Control (AFCS)					1					
*C-8477()/ASW	Control-Monitor (AFCS)					1					
*C-8478()/ASW	Controller (AFCS)					1					
CN-1179()/ASW	Displacement Gyro	1	1	1	1						
CN-1314()/A	Gyroscope					2					
*CN-1325()/ASW	Gyroscope					4					
CU-942()/ARC	FM Antenna Coupler	1	1	1	1	1					
CU-991()/AR	HF Antenna Coupler	CPO									
CU-1658()/A	HF Antenna Coupler		CPO	CPO	CPO	CPO					
F- 726()/AR	Filter	1									
ID-250()/ARN	Course Indicator	1	1	1	1	1					
ID-998()/ASN	RMI Indicator	1	1	1	1	1					
ID-1720()/ASW	Indicator (AFCS)					1					
KIT-1A/TSEC	IFF Computer	CPO	CPO	CPO	CPO	CPO					
MD-736()/A	Signal Discriminator	3	3	3	3	3					
MT-1142()/ARC	Mount (T-366()/ARC)	1									
MT-1719()/AR	Mount (CU-991()/AR)	CPO									
MT-3772A/A	Mount (CU-1658()/A)		CPO	CPO	CPO	CPO					
MT-3802()/ARC	Mount (KY-28)	1	1	1	1	1					
*MX-8611()/ASW	Accelerometer (AFCS)					2					
PP-2792()/ARN-30D	Power Supply	1									
PU-543()/A	Inverter	1	1	1	1	1					

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

CH-54		CH-54A (66-18408-66-18413)	CH-54A (67-18414-66-18431)	CH-54A (68-18432-68-18461)	CH-54A (69-18464-69-18471)	CH-54B (69-18462-69-18463) CH-54B (69-18472-69-18484)					
TYPE NUMBER	FUNCTION/NOUN										
SN-410()/ASW-29	Synchro (AFCS)					1					
SN-441()/ASW	Synchro (AFCS)					2					
*SN-442()/ASW	Synchronizer (AFCS)					2					
T-366()/ARC	VHF-FM Transmitter	1									
TS-1843()/APX	IFF Test Set	¹ /CPO	¹ /CPO	¹ /CPO	¹ /CPO	¹ /CPO					
TSEC/KY-28	Comm Security Set	CPO	CPO	CPO	CPO	CPO					
TW-333/ASH-19	Message Tape				2	2					
	Signal Adapter				1	1					

¹/Either the AN/APX-44 or AN/APX-72 may be installed but not both.

²/Either the AN/ARC-54 or AN/ARC-131 may be installed but not both.

³/Installed upon availability of equipment.

* Electronic components comprising the CH-54B AFCS system. The Flight Control System (AN/ASW-29) for CH-54A is shown as a complete system.

2-2. Avionics and Surveillance Equipment Configurations (CONT).

[illegible]

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

¹/The AN/ARC-51BX was installed in lieu of the AN/ARC-116 during production. Replacement of AN/ARC-51BX is predicated on availability of AN/ARC-116.

²/Installed in S/N 65-12916 and 65-12917 only.

³/Installed in S/N 65-12918 and subsequent aircraft.

⁴/Installed in S/N 68-17353 and subsequent aircraft.

⁵/Installed in S/N 68-17306 and subsequent aircraft.

⁶/Installed when equipment becomes available.

* FY-68-69 aircraft contain wiring provisions for 2 ea AN/ARC-114, 1 ea AN/ARC-115 and 1 ea AN/ARC-116; however, the maximum number of sets that can be installed at any given time is 3. i.e. 1 ea AN/ARC-114, 1 ea AN/ARC-115, 1 ea AN/ARC-116 or 2 ea AN/ARC-114 and 1 ea AN/ARC-115 or 2 ea AN/ARC-114 and 1 ea AN/ARC-116.

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

OH-13		OH-13H	OH-13S										
TYPE NUMBER	FUNCTION/NOUN												
AN/ARA-31	FM Antenna Group	1	1										
AN/ARA-56	FM Antenna Group		² / ₁										
AN/ARC-44	VHF-FM Radio Set	³ / ₁	³ / ₁										
AN/ARC-45	UHF-AM Radio Set		1										
AN/ARC-54	VHF-FM Radio Set		³ / ₁										
AN/ARC-60	UHF-AM Radio Set	1											
AN/ARC-73	VHF-AM Radio Set		CPO										
AN/ARC-111	VHF-AM Radio Set	¹ / ₁											
AN/3151-2	Battery		1										
AS-1703()/ARC	VHF-FM Antenna		³ / ₁										
AT-1108()/ARC	UHF-VHF Antenna		³ / ₁										
C-1611()/AIC	Intercom Set		³ / ₂										
CU-942()/ARC	Coupler		³ / ₁										
ID-48()/ARN	Course Indicator		³ / ₁										
MX-1646/AIC	Headset Adapter	2	³ / ₂										

¹/OH-13H aircraft were produced in 1955 through 1959 with factory installation of AN/ARC-60, AN/ARC-44, and the AN/ARA-31. OH-13H models scheduled for Europe will have the ARC Type 12 system installed. The ARC Type 12 will be replaced by the AN/ARC-111 in Europe. Complete provisions for the AN/ARC-60 will be retained.

²/Installed in FY64 models only on production. Installed on FY63 aircraft under Project ZYR.

³/Installed in FY63 models only on production. Remove under Project ZYR.

2-2. Avionics and Surveillance Equipment Configurations (CONT).

OH-23											
TYPE NUMBER	FUNCTION/NOUN	OH-23D	OH-23F	OH-23G							
AN/ARA-31	FM Antenna Group	1	1	¹ / ₁							
AN/ARA-56	FM Antenna Group			⁴ / ₁							
AN/ARC-44	VHF-FM Radio Set	1	1	¹ / ₁							
AN/ARC-45	UHF-AM Radio Set			³ / ₁							
AN/ARC-54	VHF-FM Radio Set			⁴ / ₁							
AN/ARC-60	UHF-AM Radio Set	1		² / ₁							
AN/ARC-73	VHF-AM Radio Set			³ / _{CPO}							
AN/ARN-59	ADF Receiver		1								
AN-3151-2	Battery	1		1							
AS-1703/ARC	VHF-FM Antenna			⁴ / ₁							
AT-1108/ARC	UHF-VHF			³ / ₁							
C-1611 ()/AIC	Intercom Set			⁴ / ₂							
CU-942/ARN	Antenna Coupler			⁴ / ₁							
ID-48()/ARN	Course Indicator			⁴ / ₁							
MX-1646/AIC	Headset Adapter	2	3	² / ₂							
BB-434/A	Battery		1								
*T-22RA/M(AN/ARC-95)	HF AM Radio Set		1								
AT-454/AR	Antenna	1	1								

¹/Installed in FY62 and FY63 aircraft only.²/Installed in FY62 aircraft only.³/Installed in FY63 and FY64 aircraft only.⁴/Installed in FY64 aircraft only on production.

* Commercial Item

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

UH-1		UH-1B/C (66-601 & Prior)	(66-602 & Subsequent)	(66-15106 & Subsequent)	(66-15148 & Subsequent)	UH-1D/H (65-12895 & Prior)	UH-1D/H (66-746 & Subsequent)	UH-1D/H (66-16307 & Subsequent)	UH-1D/H (67-17145 & Subsequent)	UH-1D/H (67-17778 & Subsequent)	UH-1M
TYPE NUMBER	FUNCTION/NOUN										
AM-3209()/ASN	Servo Amplifier	1	1	1	1	1	1	1	1	1	1
AN/AAS-29	IR Night Vision Sys										1
AN/APX-44 or	IFF Transponder	1	1	1	1	1	1	1	1		
AN/APX-72	IFF Transponder	1	1	1	1	1	1	1	1	1	1
AN/ARC-51BX	UHF-AM Radio Set	1	1	1	1	1	1	1	1	1	1
AN/ARC-54 or	VHF-FM Radio Set	1	1	1	1	1	1	1	1	1	1
AN/ARC-131	VHF-FM Radio Set	1	1	1	1	1	1	1	1	1	
AN/ARC-73	VHF-AM Radio Set	CPO	CPO			CPO	CPO				$\frac{3}{4}$ CPO
AN/ARC-102	HF-AM Radio Set	$\frac{3}{4}$ CPO	CPO	CPO	CPO	$\frac{1}{4}$ CPO	CPO	CPO	CPO	CPO	CPO
AN/ARC-134	VHF-AM Radio Set			1	1			1	1	1	$\frac{3}{4}$
AN/ARN-30()	VOR Receiver	1				1					$\frac{3}{4}$
AN/ARN-59()	ADF Receiver	1				1					$\frac{3}{4}$
AN/ARN-82	VOR Receiver		1	1	1		1	1	1	1	$\frac{3}{4}$
AN/ARN-83	ADF Receiver		1	1	1		1	1	1	1	$\frac{3}{4}$
AN/ASN-43	Gyro Compass				1				1	1	$\frac{3}{4}$
AN/ASQ-132	Night Vision Image St										1
AS-1304()/ARN	VOR Antenna	1	1	1	1	1	1	1	1	1	1
AS-1703()/AR	FM Comm Antenna	1	1	1	1	$\frac{5}{8}$	1	1	1	1	1
AS-1922()/ARC	FM Homing Antenna	1	1	1	1	$\frac{5}{8}$	1	1	1	1	1
AT-640()/ARN	Marker Beacon Ant	1	1	1	1	1	1	1	1	1	1
AT-1108()/ARC	UHF-VHF Comm Ant	1	1	1	1	$\frac{5}{8}$	1	1	1	1	1
BB-433()/A	Battery	1	1	1	1	1	1	1	1	1	1
C-1611()/AIC	Intercom Set	4	4	4	4	$\frac{5}{4}$	4	4	4	4	4
C-8157()/ARC	Control-Ind Ass'y	1	1	1	1	1	1	1	1	1	1
CU-991()/ARC or	HF Antenna Coupler	$\frac{3}{4}$ CPO	CPO	CPO	CPO	$\frac{1}{4}$ CPO	CPO	CPO	CPO	CPO	CPO

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

UH-1		UH-1B/C (66-601 & Prior)	UH-1B/C (66-602 & Subsequent)	UH-1B/C (66-15106 & Subsequent)	UH-1B/C (66-15148 & Subsequent)	UH-1D/H (65-12895 & Prior)	UH-1D/H (66-746 & Subsequent)	UH-1D/H (66-16307 & Subsequent)	UH-1D/H (67-16449 & Subsequent)	UH-1D/H (67-17778 & Subsequent)	UH-1M
TYPE NUMBER	FUNCTION/NOUN										
CU-1658()/A	HF Antenna Coupler	$\frac{1}{2}$ CPO	CPO	CPO	CPO	$\frac{1}{2}$ CPO	CPO	CPO	CPO	CPO	CPO
CV-1275()/ARN	RMI Converter	1				1					$\frac{3}{4}$
ID-250()/ARN	Course Indicator	1	1	1	1	1	1	1	1	1	1
ID-998()/ASN	RMI Indicator	1	1	1	1	1	1	1	1	1	1
ID-1347()/ARN-82	Course Indicator		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$		$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$		$\frac{3}{4}$
J-2	Gyro Compass	1	1	1		1	1	1			$\frac{3}{4}$
KIT-1A/TSEC	IFF Computer	CPO	CPO	CPO	CPO	$\frac{5}{8}$ CPO	CPO	CPO	CPO	CPO	CPO
MC-1	Rate Switch Gyro	1	1	1	1	1	1	1	1	1	1
MD-1	Roll/Pitch Disp Gyro	1	1	1	1	1	1	1	1	1	1
MD-736()/AR	Signal Discriminator	4	4	4	4	$\frac{5}{4}$	4	4	4	4	4
MT-1719()/AR or	Mount (CU-991()/AR)	$\frac{1}{2}$ CPO	CPO	CPO	CPO	$\frac{1}{2}$ CPO	$\frac{1}{2}$ CPO	CPO	CPO	CPO	CPO
MT-3772A/A	Mount (CU-1658()/A)	$\frac{1}{2}$ CPO	CPO	CPO	CPO	$\frac{1}{2}$ CPO	CPO	CPO	CPO	CPO	CPO
MT-3802()/ARC	Mount (KY-28)	1	1	1	1	1	1	1	1	1	1
PU-543()/A	Inverter	2	2	2	2	2	2	2	2	2	2
R-1041()/ARN	Marker Beacon Rec	$\frac{5}{8}$ CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO	CPO
T-366()/ARC	VHF-AM Transmitter	1	1	1		1	1				$\frac{3}{4}$
TS-1843()/APX	IFF Test Set	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO
TSEC/KY-28	Comm Security Set	CPO	CPO	CPO	CPO	$\frac{5}{8}$ CPO	CPO	CPO	CPO	CPO	CPO
Bell #205-706-027-1	HF Antenna Kit	$\frac{1}{2}$ CPO	CPO	CPO	CPO	$\frac{1}{2}$ CPO	CPO	CPO	CPO	CPO	CPO

^{1/}Provisions for AN/ARC-102, CU-991()/AR, MT-2719()/AR, and HF Antenna Kit are not installed in FY-62 UH-1D aircraft.

^{2/}The UH-1M is a converted UH-1C aircraft. These items may or may not be installed depending on serial number of aircraft involved, (refer to UH-1B/C columns of the Avionics configuration for aircraft S/N to make this determination).

^{3/}The ID-1347()/ARN is part of the AN/ARN-82 however there are cases where other components of the AN/ARN-82 are removed leaving this item for use with the Homing Antenna Group.

^{4/}ARC-102 provisions are not installed in FY60 and FY61 UH-1B. FY62, 63 UH-1B are modified to receive ARC-102 by MWO 55-1520-211-34/23.

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

⁵/The FY62 UH-1D is not equipped with this item.

⁶/The FY60 UN-1B has CPO for R737 marker beacon.

⁷/Installed upon availability of equipment.

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

TH-55A Avionics Configuration		TH-55A											
TYPE NUMBER	FUNCTION/NOUN												
ARC Type-524M	VHF-AM Radio Set	1											
MX-1646/AIC	Headset Adapter	2											
*12-GCAB-9F	Battery Gill	1											
C-1611/AIC	Intercom Set	CPO (2)											

* Commercial Item

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

O-1		O-ID, E, G	O-IE										
TYPE NUMBER	FUNCTION/NOUN												
ID-48()/AR	Course Indicator	1	1										
ID-453()/ARN	Course Indicator												
ID-637()/ARN	Azimuth Indicator	1	1										
KS-54	Camera		CPO										
MD-736/A	Discriminator	2	2										
MT-3802()/ARC	Mount (KY-28)	1	1										
MX-1646()/AIC	Headset Adapter Amp	² / ₂	2										
R-590()	VHF Comm Rec	1	1										
R-511	ADF Receiver												
SB-329	Sig Dist Panel	³ / ₂	2										
T-363()/ARC	VHF Transmitter	1	1										
T-366()/ARC	VHF Transmitter	1	1										
TSEC/KY-28	Comm Security Set	² / _{CPO}	² / _{CPO}										

¹/USAREUR only.²/USARPAC(RVN) only.³/C-1611 installed with AN/ARC-54/131. MX-1646, SB-329 installed with AN/ARC-44.~~FOR OFFICIAL USE ONLY~~

2-2. Avionics and Surveillance Equipment Configurations (CONT).

OV-1																			
TYPE NUMBER	FUNCTION/NOUN	OV-1A	OV-1B	OV-1C	OV-1D														
AN/AAS-14() A and B	IR Detecting Set			1															
AN/AAS-24	IR Detecting Set				1/2CPO														
AN/ADR-6	Radiac Set				CPO														
AN/AJA-5	Synchrophaser	1	1	1	1														
AN/AKT-18()	Radar Data System		1																
AN/ALQ-67	Countermeasure Set		CPO	CPO	CPO														
AN/ALQ-80	Countermeasure Set				CPO														
AN/APN-22()	Radar Altimeter	1	1	1															
AN/APN-171()	Radar Altimeter			3/4	1														
AN/APR-25	Radiation Det Rec				CPO														
AN/APR-26	Radiation Det Rec				CPO														
AN/APS-94C	SLAR		1																
AN/APS-94D	SLAR				1/2CPO														
AN/APX-44 or	IFF Transponder	3/4	3/4	3/4															
AN/APX-72	IFF Transponder	3/4	3/4	3/4	3/4														
AN/ARC-51BX	UHF-AM Radio Set	1	1	1/2	1														
AN/ARC-54 or	VHF-FM Radio Set	1	1	1															
AN/ARC-131	VHF-FM Radio Set	1	1	1															
AN/ARC-102	HF-AM Radio Set	1	1	1	1														
AN/ARC-114	VHF-FM Radio Set #1				1														
AN/ARC-114	VHF-FM Radio Set #2				CPO														
AN/ARC-115	VHF-AM Radio Set				1														
AN/ARC-116	UHF-AM Radio Set																		
AN/ARC-131	VHF-AM Radio Set			1/2															
AN/ARC-134	VHF-AM Radio Set	1	1	1															
AN/ARN-30E	VOR Receiver	1	1/2	1/2															

2-2. Avionics and Surveillance Equipment Configurations (CONT).

OV-1											
TYPE NUMBER	FUNCTION/NOUN	OV-1A	OV-1B	OV-1C	OV-1D						
AN/ARN-52	TACAN Set	CPO	CPO	1% CPO	CPO						
AN/ARN-59	ADF Receiver	1	$\frac{1}{4}$	$\frac{1}{4}$							
AN/ARN-82	VOR Receiver		$\frac{1}{4}$	$\frac{1}{4}$	1						
AN/ARN-83	ADF Receiver		$\frac{1}{4}$	1							
AN/ARN-89	ADF Receiver				1						
AN/ART-41	Data Transmitter			1							
AN/ASH-19	Voice Warning Set				SWP						
AN/ASH-23	Voice Warning Rec				SWP						
AN/ASN-33	Nav Computer Set	1	1	1	1						
AN/ASN-64	Doppler Nav Set		1	1							
AN/ASN-76	Attitude Ref Set	CPO	1	1	1						
AN/ASN-86	Inertial Nav Sys				1						
AN/ASW-12	Auto-Pilot	1	1	1	1						
AN/AYA-5	Data Annotation Sys			% CPO							
AN/AYA-10	Data Annotation Sys				1						
AS-1703()/ARC	FM Comm Antenna	1	1	1							
AS-2042()/ARC	FM Homing Ant	1	1	1	1						
AS-2285()/ARC	FM Comm Antenna		1	1	1						
AT-450()/A	Data Link Antenna		1	1							
AT-741()/AR	IFF & TACAN Antenna	4	4	4	4						
AT-780	ADF Antenna		1								
AT-1108()/ARC	UHF-VHF Comm Antenna	1	1	1	1						
BB-433()/A	Battery	1	1	1	1						
C-1611()/AIC	Intercom Set	2	2	2							
C-6533()/AIC	Intercom Set				2						

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

OV-1											
TYPE NUMBER	FUNCTION/NOUN	OV-1A	OV-1B	OV-1C	OV-1D						
C-8157/ARC	Control Ind Assy	1	1	1	1						
CN-1072()/AJN	Detector Compensator			1							
CU-942()/ARC	FM Antenna Coupler	1	1	1							
CU-1658()/A	HF-AM Ant Coupler	1	1	1	1						
DT-309()/AJN	Flux Valve			1							
ID-250()/ARN	Course Indicator		$\frac{1}{2}$	$\frac{1}{2}$							
ID-663()/U	DME Course Indicator	1	$\frac{1}{2}$	$\frac{1}{2}$	1						
KA-30(A)	Still Picture Camera	CPO	CPO								
KA-60(A), B or C	Still Picture Camera	CPO		$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO						
KA-76(A)	Still Picture Camera			$\frac{3}{4}$ CPO	CPO						
KIT-1A/TSEC	IFF Computer	CPO	CPO	CPO	CPO						
KS-113(A)	Photo Surv Sys				1						
LS-38(A)	Photo Surv Cont Sys	1	1								
LS-59 or	Photo Flasher Sys			CPO	CPO						
LS-59A	Photo Flasher Sys			CPO	CPO						
MA-1	Compass Sys	1	$\frac{5}{8}$	$\frac{5}{8}$							
MD-736()/A	Signal Discriminator	2	2	2	2						
MT-3802/ARC	Mounting	1	1	1	1						
PU-544()/A	Inverter	1	1	2	1						
PU-545()/A	Inverter		2	2	1						
R-844()/ARN-58	MB/GS Receiver	1	1	1	1						
RO-166/UP	Photo Processor			1							
TS-1843()/APX	IFF Test Set	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO	$\frac{3}{4}$ CPO						
TSEC/KY-28	Comm Security Set	CPO	CPO	CPO	CPO						
25202-1	Inverter				1						

2-2. Avionics and Surveillance Equipment Configurations (CONT).

¹ / The OV-1D has a palatized interchangeability of the AN/AAS-24() & AN/APS-94D System.

² /The AN/APN-171 is installed in FY-68 OV-1C production aircraft.

³ /Either the AN/APX-44 or AN/APX-72 transponder is installed but not both. TS-1843 will be installed upon availability.

⁴ /Aircraft prior to FY-66 have the AN/ARN-30E and AN/ARN-59 installed, subsequent aircraft have the AN/ARN-82 and AN/ARN-83 installed.

⁵ / Some aircraft have the MA-1 installed, others have the AN/ASN-76.

⁶ /The AN/AYA-5 provisions are installed in FY-68 production OV-1C aircraft.

⁷ /The ID-663/U provisions have been adapted to ID-250()/ARN in early mod aircraft. Late mod aircraft have ID-663/U installed.

⁸ /KA-60() and KS-61 provisions are installed in Mod and FY-66 production aircraft; KA-76 provisions installed in FY-67 production aircraft only.

⁹ /AN/ARC-54 for FY-66, -67 aircraft only. AN/ARC-131 for FY-68 aircraft only.

¹⁰ /AN/ARN-52 installed in FY-66 and FY-67 aircraft.

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2-2 Avionics and Surveillance Equipment Configurations (CONT).

U-1A		U-1A Basic	U-1A ZYR										
TYPE NUMBER	FUNCTION/NOUN												
C-1611()/AIC	Intercom Set		3										
C-8157()/ARC	Control Ind Ass'y		1										
CU-435()/AIC	Imp Matching Net	1											
CU-991()/AR	HF Antenna Coupler	CPO	CPO										
Kit-1A/TSEC	IFF Computer	CPO	CPO										
MT-3802()/ARC	Mount (KY-28)		1										
MX-1646/AIC	Headset Adapter	2											
PU-542()/A	Inverter	$\frac{5}{2}$	$\frac{5}{2}$										
SB-329()/AR	Distribution Panel	3											
TSEC/KY-28	Comm Sec Set		CPO										
T-366/ARC	Radio Transmitter		1										
TS-1843/APX	IFF Test Set	CPO	CPO										

¹/AN/ARN-32 installed in production FY-58-59 aircraft. Further the AN/ARN-12 or AN/ARN-32 may be installed in proceeding models.

²/AN/ARN-30 VOR #2 CPO installed in production FY-58 and subsequent aircraft.

³/AN/ARN-59 ADF #1 installed in production FY-58 and subsequent aircraft.

⁴/AN/ARN-59 ADF #2 CPO installed in production FY-58 and subsequent aircraft.

⁵/AN/ASN-13 and PU-542 installed in production FY-57 and subsequent aircraft.

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

U-6A & RU-6A																			
TYPE NUMBER	FUNCTION/NOUN	U-6A Basic	U-6A ZYR	RU-6A															
AN/APX-44	IFF Transponder Set	1	1	1															
AN/APX-72	IFF Transponder Set		CPO	CPO															
AN/ARA-31	FM Antenna Group	1																	
AN/ARC-44	VHF-FM Radio Set	1																	
AN/ARC-51()	UHF-AM Radio Set		1	1															
AN/ARC-54 or	VHF-FM Radio Set		1	1															
AN/ARC-131	VHF-FM Radio Set		1	1															
AN/ARC-55()	UHF-AM Radio Set	1																	
AN/ARC-73()	VHF-AM Radio Set	CPO	CPO	CPO															
AN/ARC-102	HF-AM Radio Set	CPO	CPO	CPO															
AN/ARN-12	Marker Beacon Rec	1/1	1/1																
AN/ARN-30() #1	VOR Receiver	1																	
AN/ARN-30() #2	VOR Receiver	2/1																	
AN/ARN-30E	VOR Receiver		1	1															
AN/ARN-32	Marker Beacon Rec	1/1																	
AN/ARN-59	ADF Receiver	1	1	1															
AN/ASN-13	Gyro Map Compass	1	1																
AN/ASN-62(C-12)	ADG Reference System			1															
AS-580()/ARN-30	VOR Antenna	1	1	1															
AS-1703()/AR	VHF-FM Antenna		1	1															
AS-1922()/ARC	VHF-FM Hom Antenna		2	2															
AT-454()/ARC	Whip Antenna	1																	
AT-640()/AR	Marker Beacon Antenna	1	1	1															
AT-780()/ARN	Loop Antenna	1	1	1															
AT-884()/APX	IFF & TACAN Antenna	1	1	1															
AT-1108()/ARC	UHF-VHF Antenna	1	1	1															

2-2. Avionics and Surveillance Equipment Configurations (CONT).

U-6A & RU-6A											
TYPE NUMBER	FUNCTION/NOUN	U-6A Basic	U-6A ZYR	RU-6A							
BB-432()/A	NICAD Battery	1	1	1							
C-1611()/AIC	Intercom Set		3	3							
C-8157/ARC	Control Indicator		1	1							
CU-991()AIC	HF Antenna Coupler	CPO	CPO								
Kit-1A/TSEC	IFF Computer		CPO	CPO							
MD-736/A	Signal Discriminator		3	3							
MT-3802/ARC	Mounting		1	1							
MX-1646()AIC	Headset Adapter	2									
SB-329()/AR	Distribution Panel	2									
T-366()/ARC	Radio Transmitter	² / ₁									
TS-1843/APX	IFF Test Set		³ / _{CPO}	³ / _{CPO}							
TSEC/KY-28	Comm Security Set		CPO	CPO							

¹/The AN/ARN is installed in FY-51 through FY-56 aircraft. The AN/ARN-32 is installed in FY-57 and subsequent aircraft.

²/The T-366 and AN/ARN-30 #2 are installed by MWO 55-1510-203-30/7 and MWO 55-1510-203-30/5 respectively; see MWO's for aircraft serial numbers affected.

³/TS-1843/APX will be installed upon availability.

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

U-8											
TYPE NUMBER	FUNCTION/NOUN	U-8D (ZYU)	U-8F (ZYU)	U-8G (ZYU)	RU-8D						
AN/APX-44() or	IFF Transponder	1	1	1	1						
AN/APX-72	IFF Transponder	CPO	CPO	CPO	CPO						
AN/APN-158	Weather Radar		1								
AN/ARA-54	Receiver Group				1						
AN/ARC-51BX	UHF-AM Radio Set	1	1	1							
AN/ARC-54 or	VHF-FM Radio Set	1	1	1	1						
AN/ARC-131	VHF-FM Radio Set	1	1	1	1						
AN/ARC-73	VHF-AM Radio Set				1						
AN/ARC-102	HF-AM Radio Set	CPO	CPO	CPO	1						
AN/ARC-134	VHF-AM Radio Set	1	1	1	1						
AN/ARN-30E	VOR Receiver	1	1	1	1						
AN/ARN-32	Radio Receiver				1						
AN/ARN-52	TACAN Set	1	1	1							
AN/ARN-59	ADF Receiver	1	1	1	2						
AN/ASN-13	Gyro Compass	1	1	1	1						
AN/ASN-64	Doppler Navigational Set				1						
AS-580(A)/ARN-30	VOR Antenna	1	1	1	1						
AS-1703()/AR	FM Comm Antenna	1	1	1	1						
AT-640	Antenna				1						
AT-741()/AR	TACAN Antenna	1	1	1							
AT-805	Antenna				1						
AT-884()/APX-44	IFF Antenna	1	1	1	1						
AT-1108()/ARC	UHF-VHF Comm Antenna	1	1	1	1						
BB-432()/A	Battery	1	1	1	1						
C-1611()/AIC	Intercom Set	2	2	2	3						
C-8157()/ARC	Control-Ind Ass'y	1	1	1	1						

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

U-8		U-8D (ZYU)	U-8F (ZYU)	U-8G (ZYU)	RU-8D						
TYPE NUMBER	FUNCTION/NOUN										
CU-942()/ARC	FM Comm Antenna	1	1	1	1						
CU-1658()/A	HF Antenna Coupler	1	1	1	1						
CV-1275()/ARN	RMI Converter	1	1	1	1						
ID-250	Course Indicator				1						
ID-387()/ARN	Course Indicator	1	1	1	1						
ID-453()/ARN	Course Indicator	1	1	1	1						
ID-663()/U	BDH Indicator	1	1	1							
ID-998()/ASN	RMI Indicator	1	1	1	1						
Kit-1A/TSEC	IFF Computer	CPO	CPO	CPO	CPO						
MD-1	Roll/Pitch Disp Gyro				1						
MT-3802()/ARC	Mount (KY-28)	1	1	1	1						
PU-544()/A	Inverter	2	2	2	2						
R-844	Radio Receiver				1						
R-1041/ARN	Marker Beacon	1	1	1							
T-366()/ARC	VHF-AM Transmitter				1						
TSEC/KY-28	Comm Security Set	CPO	CPO	CPO	CPO						

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

U-10A		U-10A											
TYPE NUMBER	FUNCTION/NOUN												
AN/ARA-31	FM Antenna Group	1											
AN/ARC-44	VHF-FM Radio Set	1											
AN/ARC-51	UHF-AM Radio Set	¹ /CPO											
*AN/ARC-73	VHF-AM Radio Set	1											
*AN/ARN-30	VOR Receiver	1											
AN/ARN-32	Marker Beacon Rec	1											
*AN/ARN-59	ADF Receiving Set	1											
*AT-1108/AR	UHF-VHF Antenna	1											
*BB-432/A	NICAD Battery	1											
C-1611()/AIC	Intercom Set	3											
**CD-4	Course Indicator	² /1											
H-101/U	Helmet	3											
*PU-542/A	Inverter	1											

* Commercial Equivalent Installed.

**Commercial Item.

¹/AN/ARC-73 installed due to shortage of AN/ARC-51.

²/Aircraft Radio Corporation Type CD-4 Course Indicator System.

2-2. Avionics and Surveillance Equipment Configurations (CONT).

U-21A & RU-21											
TYPE NUMBER	FUNCTION/NOUN	RU-21A	RU-21B	RU-21C	RU-21D	RU-21E	U-21A				
A-339D-1	DME Indicator	1	1	1	1	1	1				
AM-3209()/ASN	Servo Amplifier	1	1	1	1	1	1				
AN/APN-158	Weather Radar	1	1	1	1	1	1				
AN/APR-25	Emergency Receiver				1/1	CPO					
AN/APR-26	Emergency Receiver				1/1	CPO					
AN/APR-36	Emergency Receiver				1/2CPO	CPO					
AN/APR-37	Emergency Receiver				1/2CPO	CPO					
AN/APX-44 or	IFF Transponder										
AN/APX-72	IFF Transponder	1	1	1	1	1	1				
AN/ARC-51BX	UHF-AM Radio Set	1	1	1	1	1	1				
AN/ARC-54 or	VHF-FM Radio Set										
AN/ARC-131	VHF-FM Radio Set	1	1	1	1	2	1				
AN/ARC-102	HF-AM Radio Set	1	1	1	1	1	1				
AN/ARC-134	VHF-AM Radio Set	1	1	1	1	1	1				
AN/ARN-52	TACAN Set	1	1	1	1	1	1				
AN/ARN-82	VOR Receiver	1	1	1	1	1	1				
AN/ARN-83	ADF Receiver	1	1	1	1	1	1				
AN/ARN-13A	Attitude Indicator	1	1	1							
AN/ARN-103	TACAN					1					
AN/ASN-43	Gyro Compass	1			1	1	1				
AN/ASN-76	Compass		1	1							
AN/ASN-86	Guidance System	1	1	1	1	1					
AS-580()/ARN	VOR Antenna	1	1	1	1	1	1				
AS-1520()/APN-158	Radar Antenna	1	1	1	1	1	1				
AS-1703()/AR	FM Comm	1					1				
AS-1863/ARN-83	ADF Antenna	1	1	1	1	1	1				

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2-2. Avionics and Surveillance Equipment Configurations (CONT).

U-21A & RU-21													
TYPE NUMBER	FUNCTION/NOUN	RU-21A	RU-21B	RU-21C	RU-21D	RU-21E	U-21A						
AS-1869()/ARN	ADF Sense Antenna						1						
AS-1922()/ARC	Homing Antenna	1	1	1	1	1	1						
AS-2285()/ARC	FM Comm Antenna	1	1	1	1	2							
AT-454()/ARC	HF Comm Antenna				1	1							
AT-640()/ARN	Marker Beacon Ant	1	1	1	1	1	1						
AT-884()/APX	IFF & TACAN Antenna	2	2	2	2	2	2						
AT-1108()/ARC	UHF/VHF Comm Antenna	1	1	1	1	1	1						
BB-433()/A	Battery	1	1	1	1	1	1						
C-1611()/AIC	Intercom Set	3	3	3	3	4	3						
C-8157()/ARC	Control-Ind Ass'y	1	1	1	1	2							
CN-405()/ASN	Mag Flux Compensator	2	2	2									
Collins 582-A	Quad Error Corrector	1	1	1									
CU-942()/ARC	FM Antenna Coupler	1	1	1	1	1	1						
CU-1658()/A	HF Antenna Coupler	1	1	1	1	1	1						
Dorsal F/N	ADF Sense Antenna	1	1	1									
H-14	Auto Pilot	1	1	1									
ID-250()/ARN	Course Indicator				1	2	1						
ID-387()/AR	TACAN Course Ind	1	1	1	1	1	1						
ID-998()/ASN	RMI Indicator	1	1	1	1	1	1						
ID-1347/ARN-82	Course Indicator	1	1	1	1	1	2						
KIT-1A/TSEC	IFF Computer	CPO	CPO	CPO	CPO	CPO	CPO						
MC-1	Rate Switch Gyro				1	1	2						
MD-1	Roll/Pitch Disp Gyro				1	1	2						
MD-736/A	Signal Discriminator	3	3	3	3	4	3						
MGH-229-100	Inverter	1	1	1									
MT-3772()/A	Mount (CU-1658()/A)	1	1	1	1	1	1						

2-2. Avionics and Surveillance Equipment Configurations (CONT).

U-21A & RU-21											
TYPE NUMBER	FUNCTION/NOUN	RU-21A	RU-21B	RU-21C	RU-21D	RU-21F	U-21A				
PU-543()/A	Mount				1						
PU-544()/A	Mount					1					
PU-545()/A	Mount	2	2	2	2	2	2				
R-844()/ARN-58	MB/GS Receiver	1	1	1	1	1	1				
T-611()/ASN	Compass Transmitter	2	2	2	1	1					
T-992()/A	Air Speed Trans				1	1					
TS-1843/APX	IFF Test Set	² CPO	² CPO	² CPO	² CPO	² CPO	² CPO				
TSEC/KY-28	Comm Security Set	CPO	CPO	CPO	CPO	CPO	CPO				
50-345615	HF Antenna	1	1	1			CPO				
50-346063	HF Antenna				1	1					
50-640003-79	ADF Sense Antenna				1	1					

¹/Installed in selected aircraft.²/Installed when equipment becomes available.~~FOR OFFICIAL USE ONLY~~

2-2. Avionics and Surveillance Equipment Configurations (CONT).

T-41B		T-41B																	
TYPE NUMBER	FUNCTION/NOUN																		
AN/ARC-54	VHF-FM Radio Set	CPO																	
AN/ARN-83	ADF Receiving Set	1																	
AS-1703()/AR	VHF-FM Antenna	CPO																	
AS-1922()/ARC	VHF-FM Hom Antenna	CPO																	
C- 1611()/AIC	Intercom Set	3																	
CU-942()/ARC-54	FM Antenna Coupler	CPO																	
ID-718/ARN	Azimuth Indicator	1																	
*A-25A	Antenna	2																	
*ARC-515R	VOR Receiver	1																	
*P/N 08700-60-1	Battery (Cessna)	1																	
*BEI-901C	VHF-AM Radio Set	1																	
*P/N 23-401-20	Garvin Inc	1																	
*P/N 23-501-03	Garvin Inc	1																	
*0570039-1	Sense Antenna	1																	
*37R-2A	Antenna	1																	

* Commercial Item.

2-2. Avionics and Surveillance Equipment Configurations (CONT).

T-42A		T-41B											
TYPE NUMBER	FUNCTION/NOUN												
AN/APX-44()	IFF Transponder Set	CPO											
AN/ARC-51BX	UHF-AM Radio Set	CPO											
AN/ARC-111	VHF-AM Radio Set	1											
AN/ARN-30()	VOR Receiver	2											
AN/ARN-59	ADF Receiving Set	1											
*ARC-105B	Transponder	1											
AT-1108()/ARC	UHF-VHF Antenna	1											
BB-432/A	NICAD Battery	1											
C-1611()/AIC	Intercom Set	4											
CV-1275()/ARN	RMI Converter	2											
ID-250()/ARN	Course Indicator	1											
ID-998()/ASN	Compass Indicator	1											
PU-542()/A	Inverter	2											
R-844()/ARN-58	UHF Receiver	1											
T-366()/ARC	Radio Transmitter	1											
*C-14	Gyro Compass	1											

* Commercial Item.

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2-3. Aircraft Armament.

The following aircraft armament subsystems and related components are either in the Research and Development stage, or have been type classified for field usage.

2-4. M5 Armament Subsystem.

Armament subsystem: M5

Aircraft series: UH-1B/C

Costs:

Acquisition - \$33,039

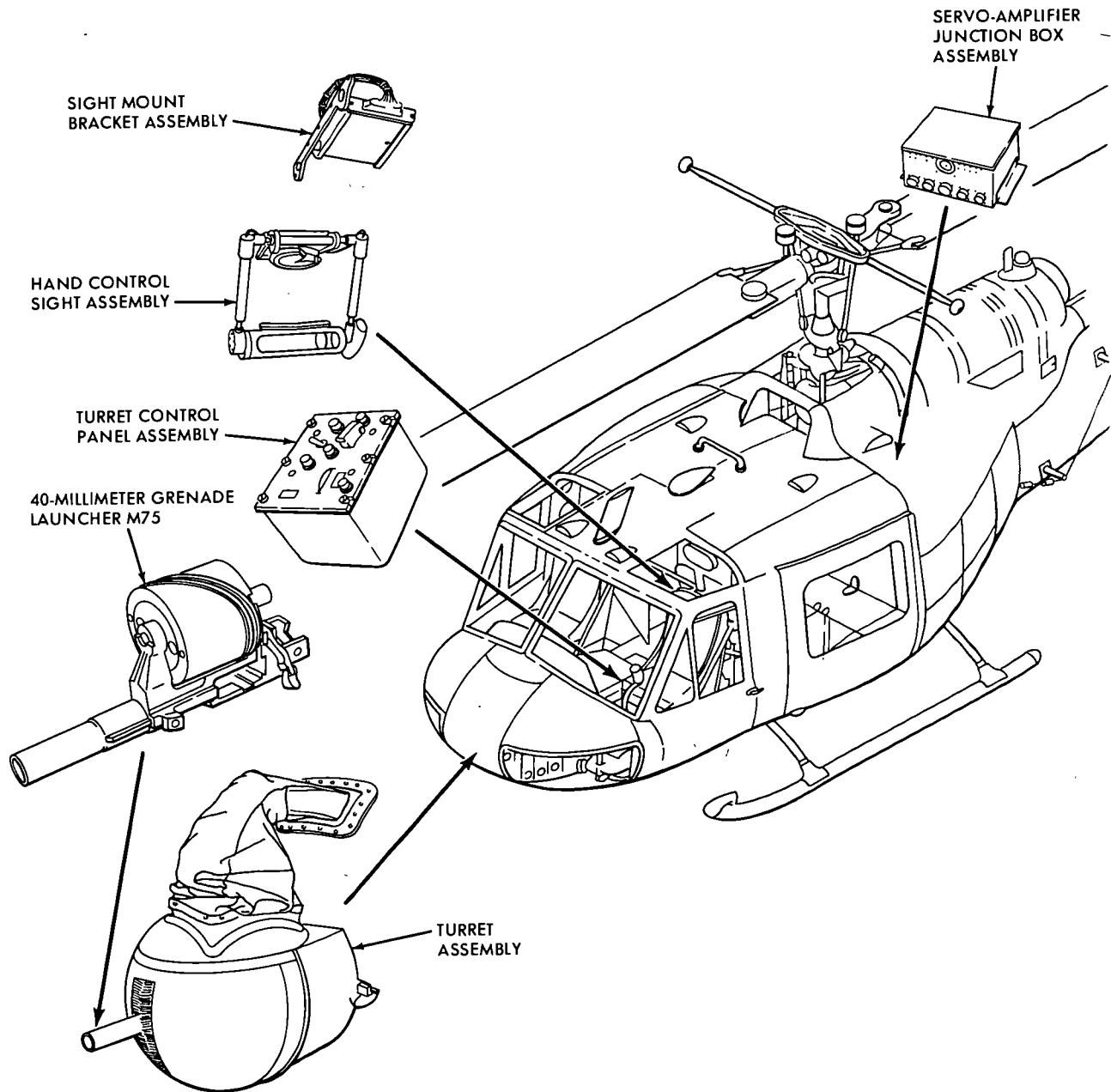
Replacement - \$29,826

Type classification: STD-A

Nomenclature: Armament subsystem, helicopter, 40-millimeter grenade launcher: M5.

Description: The M5 Armament subsystem consists of one 40-millimeter grenade launcher M75 mounted in a nose turret, with an ammunition feed system, turret control panel assembly, sight assembly, and servo-amplifier junctionbox assembly. Subsystem firing rate is 225 to 230 rounds per minute. Ammunition feed system holds 300 rounds. Pilot can fire from cyclic stick; copilot can fire from cyclic stick or sight assembly.

Remarks: Production contracts for M-5 subsystems have been completed. No new procurement is planned.



AV 000132

Figure 2-1. M5 Armament subsystem components

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Figure 2-2. M5 Armament subsystem installed on UH-1B/C (Iroquois) helicopter

2-5. M18A1 Armament Subsystem.

Armament subsystem: M18A1

Aircraft series: AH-1G

Costs:

Acquisition — \$20,200

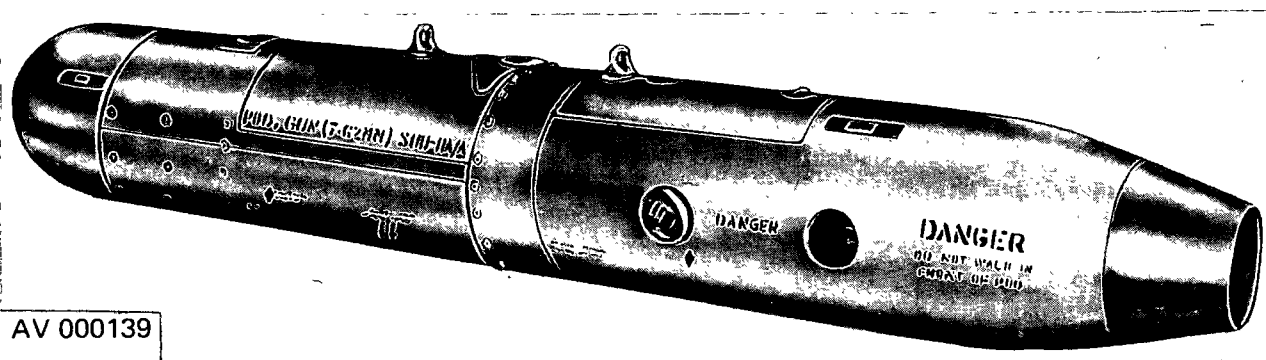
Replacement — \$20,070

Type classification: STD-A

Nomenclature: Armament pod, aircraft, 7.62-millimeter machinegun: high-rate, M18A1.

Description: The M18A1 Armament Subsystem consists of one 7.62 Millimeter Automatic Gun, M134, in a cylindrical pod mounted on the inboard and/or outboard wing stores of the Aircraft. The pod stores 1500 rounds of ammunition in a linkless feed system. The gun is electrically driven at either slow rate, 2000 shots per minute, or high rate, 4000 shots per minute. The pod is self-powered by a self contained battery with a power start feature using auxiliary aircraft power for more starting torque. The pod is rigidly mounted and aiming is accomplished by maneuvering the aircraft.

Remarks: Production contracts for M18A1 Subsystems have been completed.



AV 000139

Figure 2-3. M18A1 Armament subsystem

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2-6. M21 Armament Subsystem.

Armament subsystem: M21

Aircraft series: UH-1B/C/M

Costs:

Acquisition — \$32,214

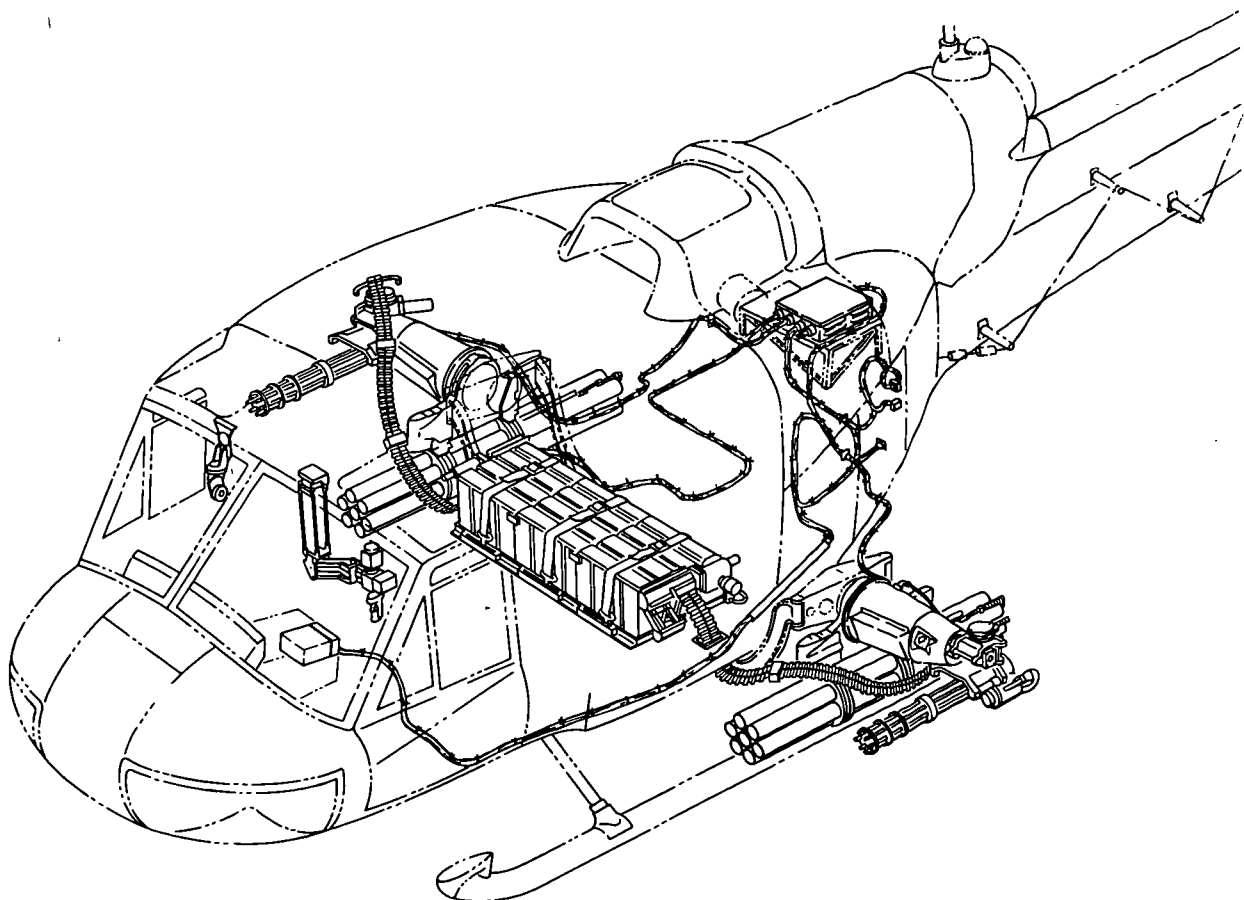
Replacement — \$32,214

Type classification: STD-A

Nomenclature: Armament subsystem, helicopter, 7.62-millimeter machinegun, 2.75-inch rocket launcher: twin, high-rate, M21.

Description: The M21 Armament subsystem consists of two 7.62-millimeter automatic guns M-134 mounted, one per side, on left and right mount assemblies. The mount assemblies attach to left and right rack and support assemblies, which are attached to helicopter external stores assemblies. The rack and support assemblies also provide mounting for two 7-round, 2.75-inch rocket launchers M-158A1. The guns are controlled by a flexible sighting station and control panel and are flexed by hydraulic power with electrical control. The pilot uses a reflex sight M60 and maneuvers the aircraft to aim the rockets or the guns in stowed mode. Electrical firing impulses are controlled through an intervalometer in the console. Pilot or copilot can fire guns, or rockets in stowed mode, from cyclic stick. Copilot only can fire the guns in flexible mode from the flexible sighting station. Guns each fire approximately 2400 rounds per minute, but when either gun reaches an inboard limit, it is automatically stopped and the other gun speeds up to 4000 rounds per minute. Twelve ammunition boxes and chuting supply 3000 rounds of ammunition per gun. Control circuits limit length of machinegun burst to 3 seconds.

Remarks: Production contracts for M21 subsystem have been completed. No new procurement is planned.



AV 000140

Figure 2-4. M21 Armament subsystem installed on UH-1B/C (Iroquois) helicopter

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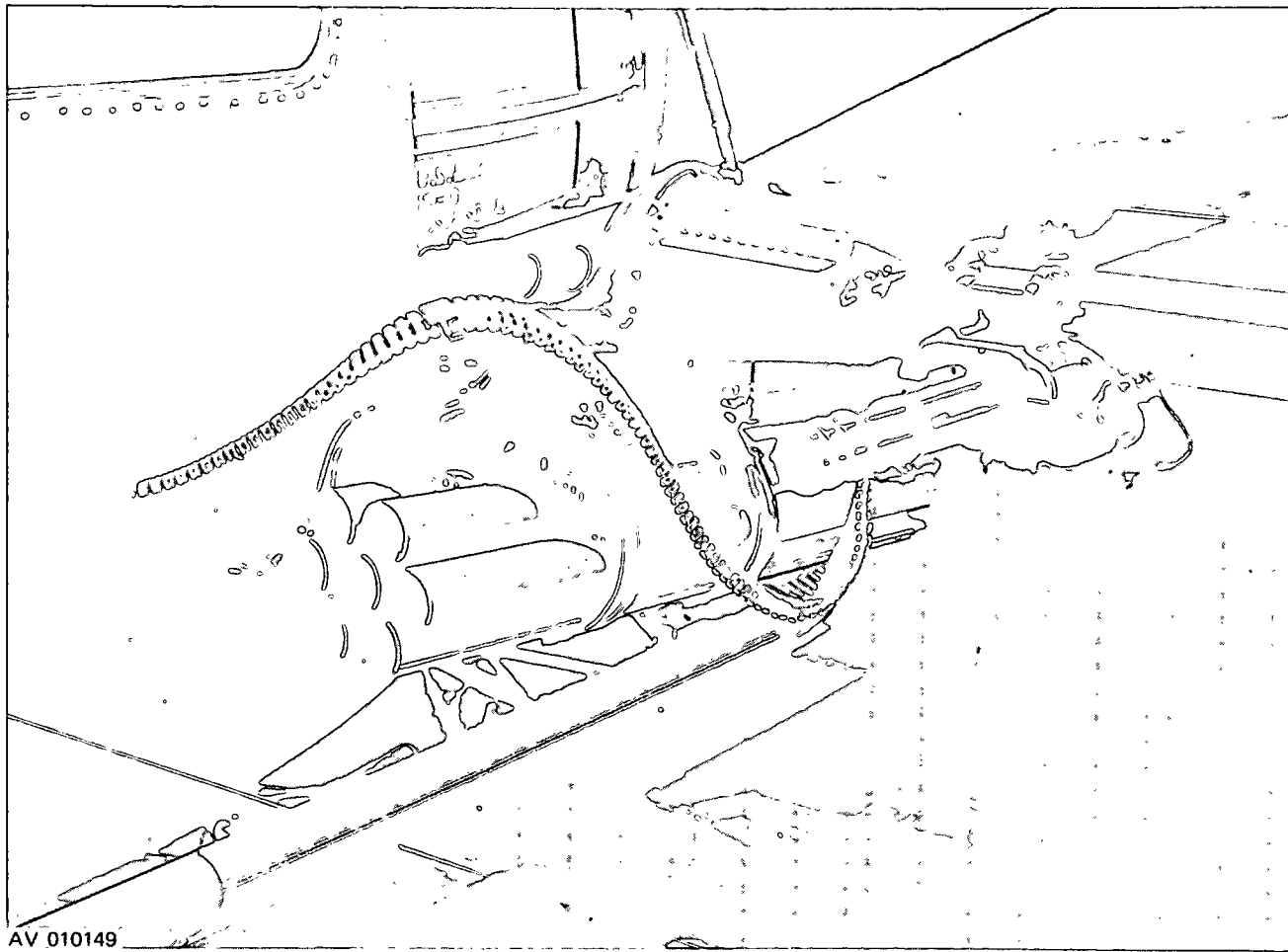


Figure 2-5. M21 Armament subsystem installed on UH-1B/C (Iroquois) helicopter

2-8. M23 Armament Subsystem

Armament subsystem: M23

Aircraft series: UH- 1D/H

Costs:

Acquisition — \$7740

Replacement — \$2,992

Type classification: STD-A

Nomenclature: Armament subsystem, helicopter, 7.62-millimeter machinegun: door-mounted, lightweight, M23.

Description: The M23 Armament subsystem consists of two flexible, 7.62-millimeter machineguns M60D, one on each side of helicopter, mounted on post-and-pintle type mounts which secure to hard points on the helicopter. Mounts are located so guns can be fired by gunners standing in the open doors of the cargo compartment. Maximum gun traversing movements are controlled by shape and size of pintle pivots which carry the guns. A traversing lock on each pintle post holds the gun in stowed position. Each mount has an ammunition box assembly and chuting to the gun. Capacity is 600 rounds per gun. Gun firing rate is 550 rounds per minute. Spent cartridges are caught in an ejection control bag on the right side of each gun.

Remarks: The M23 is currently being procured.

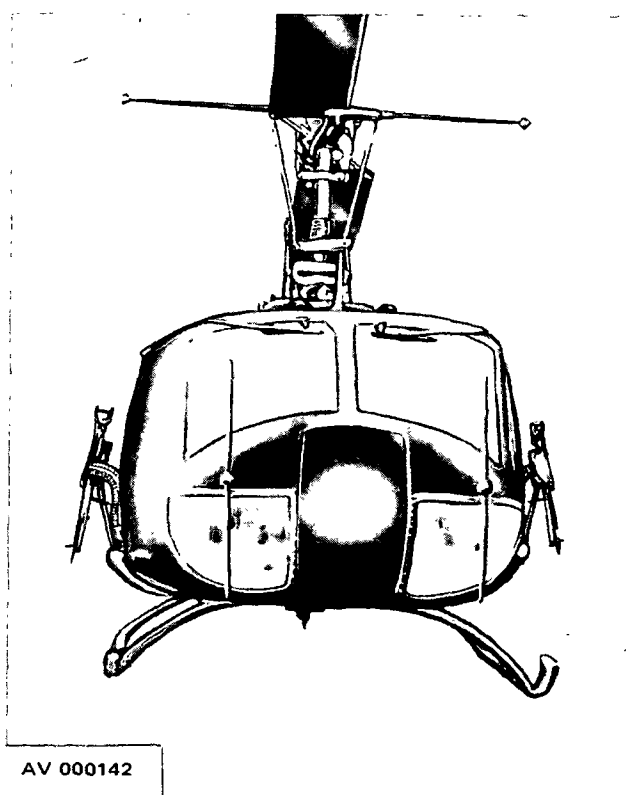
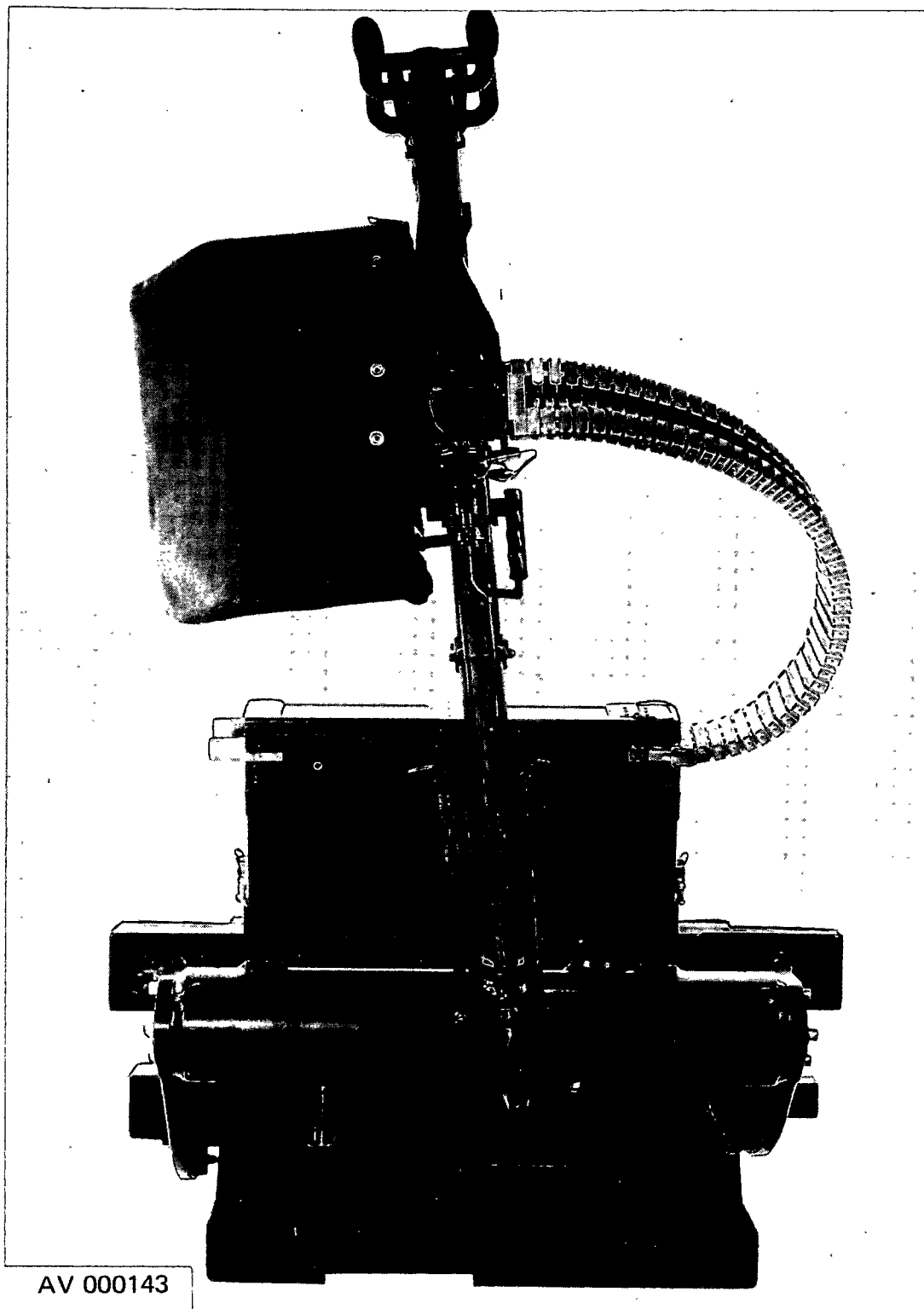


Figure 2-7. M23 Armament subsystem on UH-1D (Iroquois) helicopter

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AV 000143

Figure 2-8. M23 Armament subsystem in forward stowed position (Front view)

2-9. M24 Armament Subsystem.

Armament subsystem: M24

Aircraft series: CH-47A/B/C

Costs:

Acquisition — \$5560

Replacement — \$2262

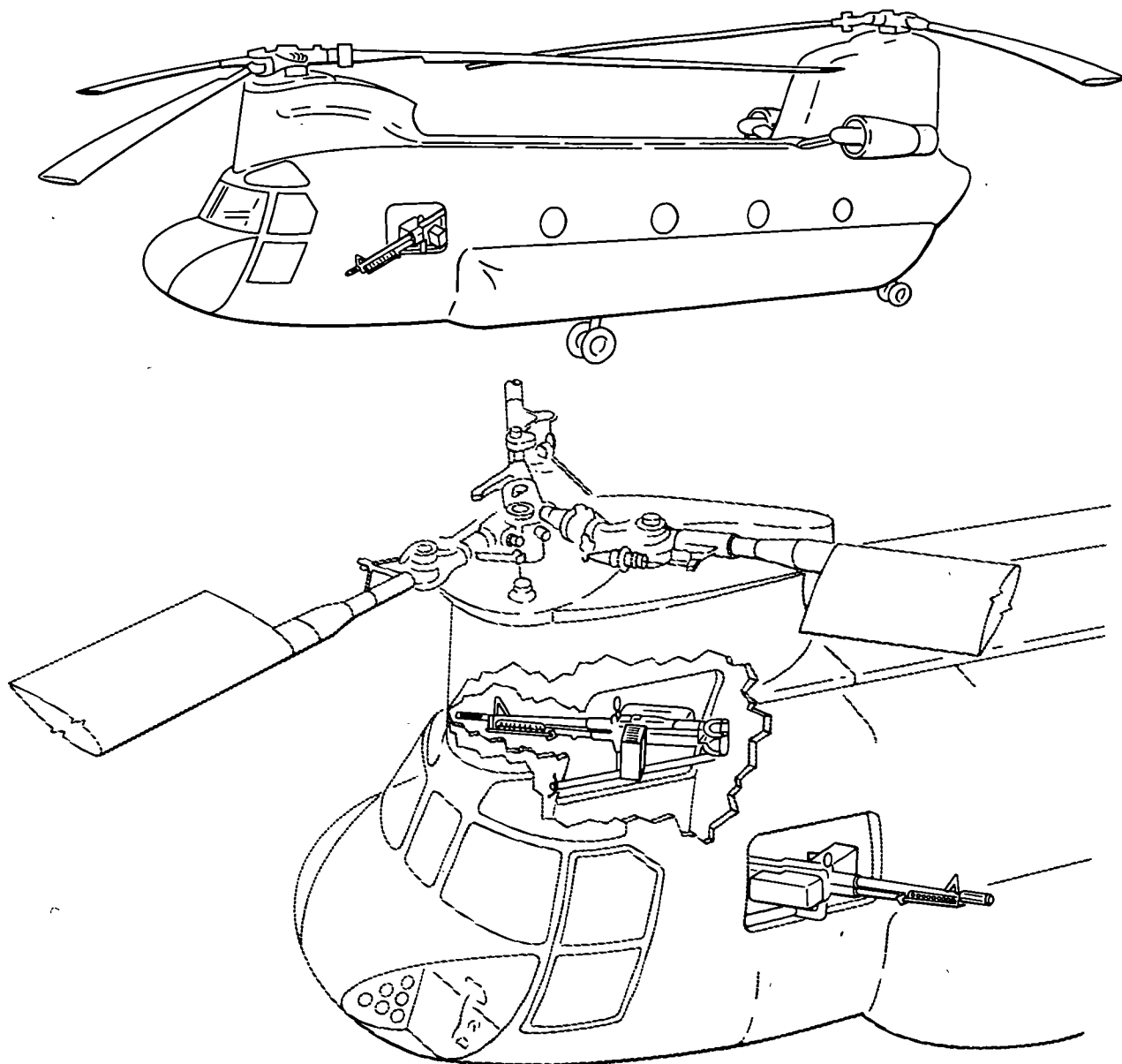
Type classification: STD-A

Nomenclature: Armament subsystem, helicopter, 7.62-millimeter machinegun: door-mounted, lightweight, M24.

Description: The M24 Armament subsystem consists of two flexible, 7.62-millimeter machineguns M60D, one on each side of helicopter, mounted on horizontal post-and-pintle type mounts which secure to the escape hatch on the left side and the cabin door frame on the right side. Guns are held in stowed position by a shock cord assembly attached to the rear mounting bracket of each mount. An ammunition can assembly holding two boxes of 100 linked rounds in each box is attached to the left side of each gun. Gun firing rate is 550 rounds per minute. Spent cartridges are caught in an ejection control bag on the right side of each gun.

Remarks: Production contracts for M24 Armament subsystem have been completed.

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AV 000144

Figure 2-9. M24 Armament subsystem installed on CH-47A (Chinook) helicopter

2-11. XM27E1 Armament Subsystem.

Armament subsystem: XM27E1

Aircraft series: OH-6A/OH-58A

Costs: OH-58A

Acquisition — \$28,576

Replacement — \$17,579

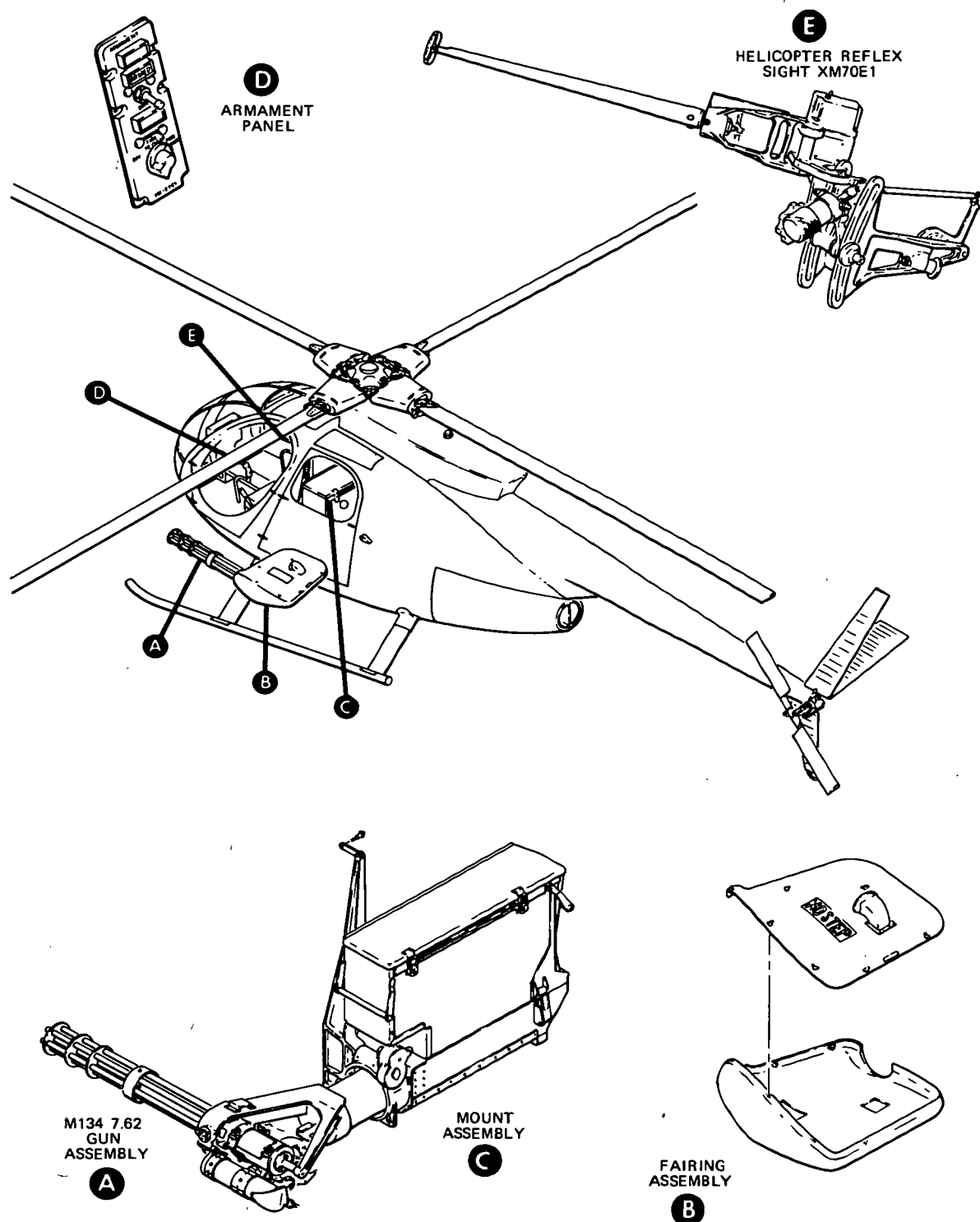
Type classification: LP

Nomenclature: Armament subsystem, helicopter, 7.62-millimeter machinegun: high-rate XM27E1.

Description: The XM27E1 Armament Subsystem consists of one 7.62 Millimeter automatic gun, M134, attached to a mount assembly which is secured to hard points in the helicopter on the left side. An XM70E1 reflex sight is secured to the helicopter and connected by mechanical linkage to the mount assembly. The sight provides control for the gun in elevation and depression. The gun is fired at 2000 rounds per minute or 4000 rounds per minute from a trigger on the cyclic stick. The subsystem operates on 22 — 30 VDC aircraft power and has an ammunition capacity of 2000 rounds.

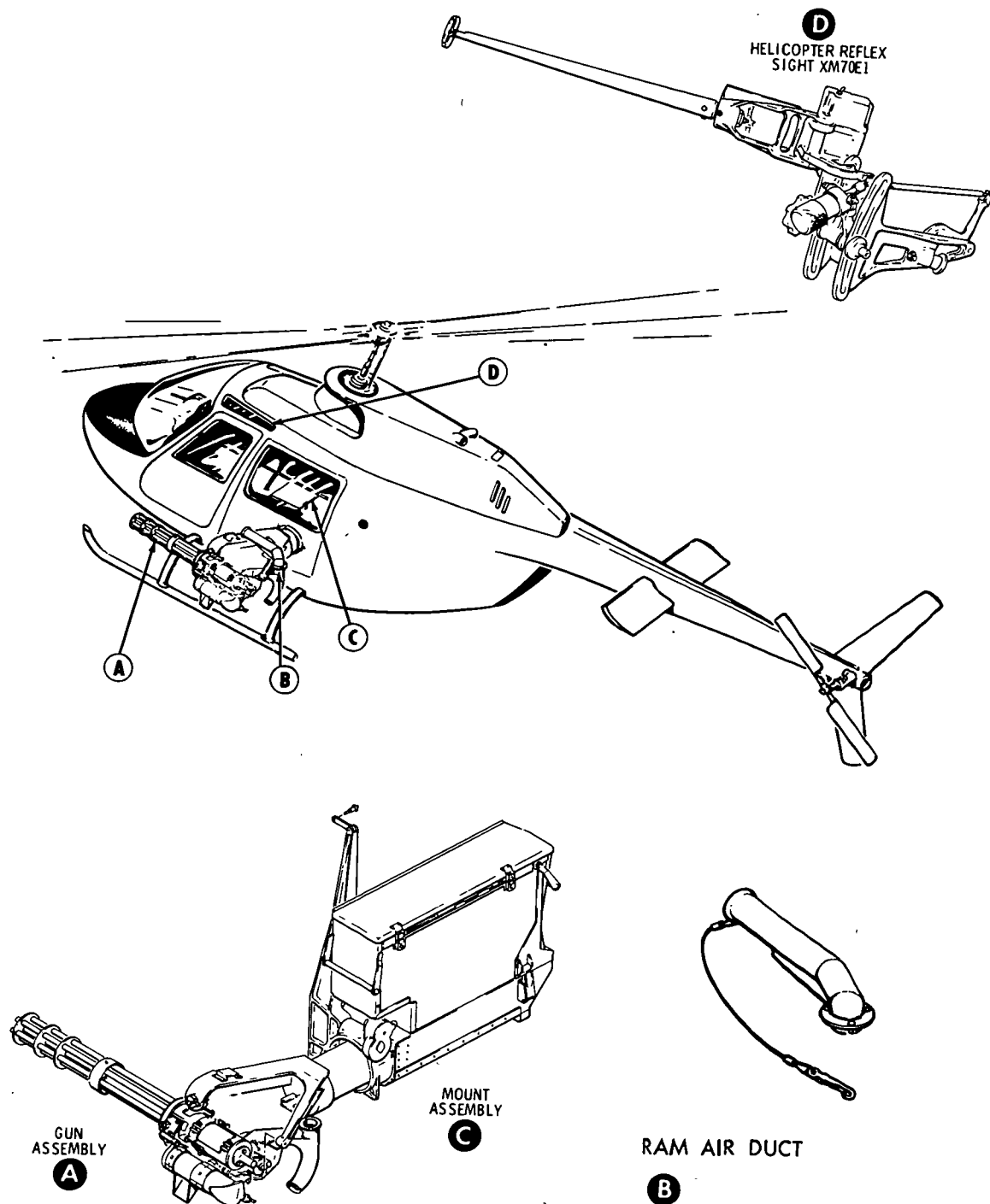
Remarks: Production contracts for XM27E1 subsystems have been completed. Appropriate action is under way to type classify the XM27E1 subsystem as STD B.

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AV 000146

Figure 2-11. XM27E1 Armament system components



AV 000215

Figure 2-12. XM27E1 with ram air duct

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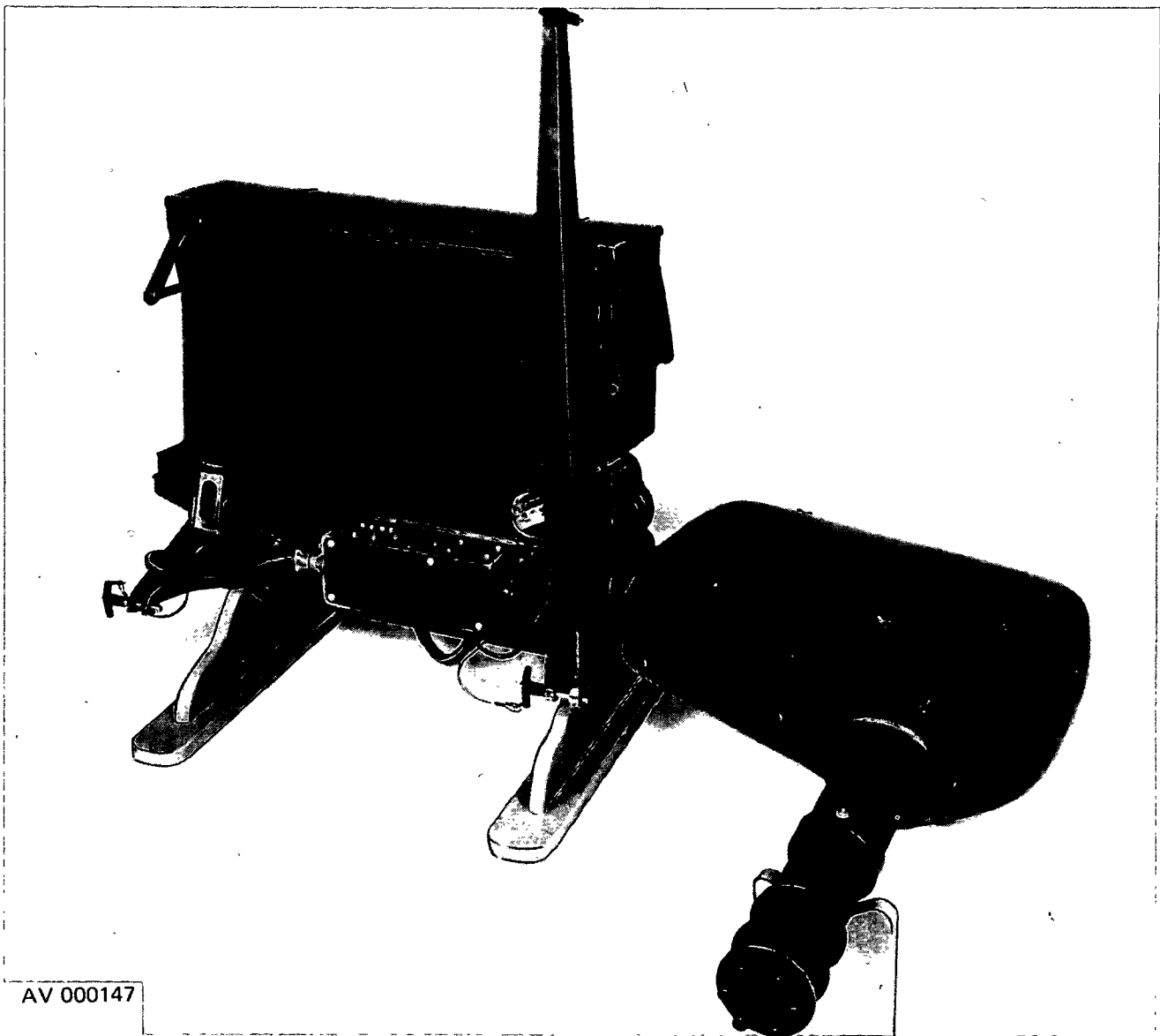


Figure 2-13. XM27E1 Armament subsystem with fairing installed

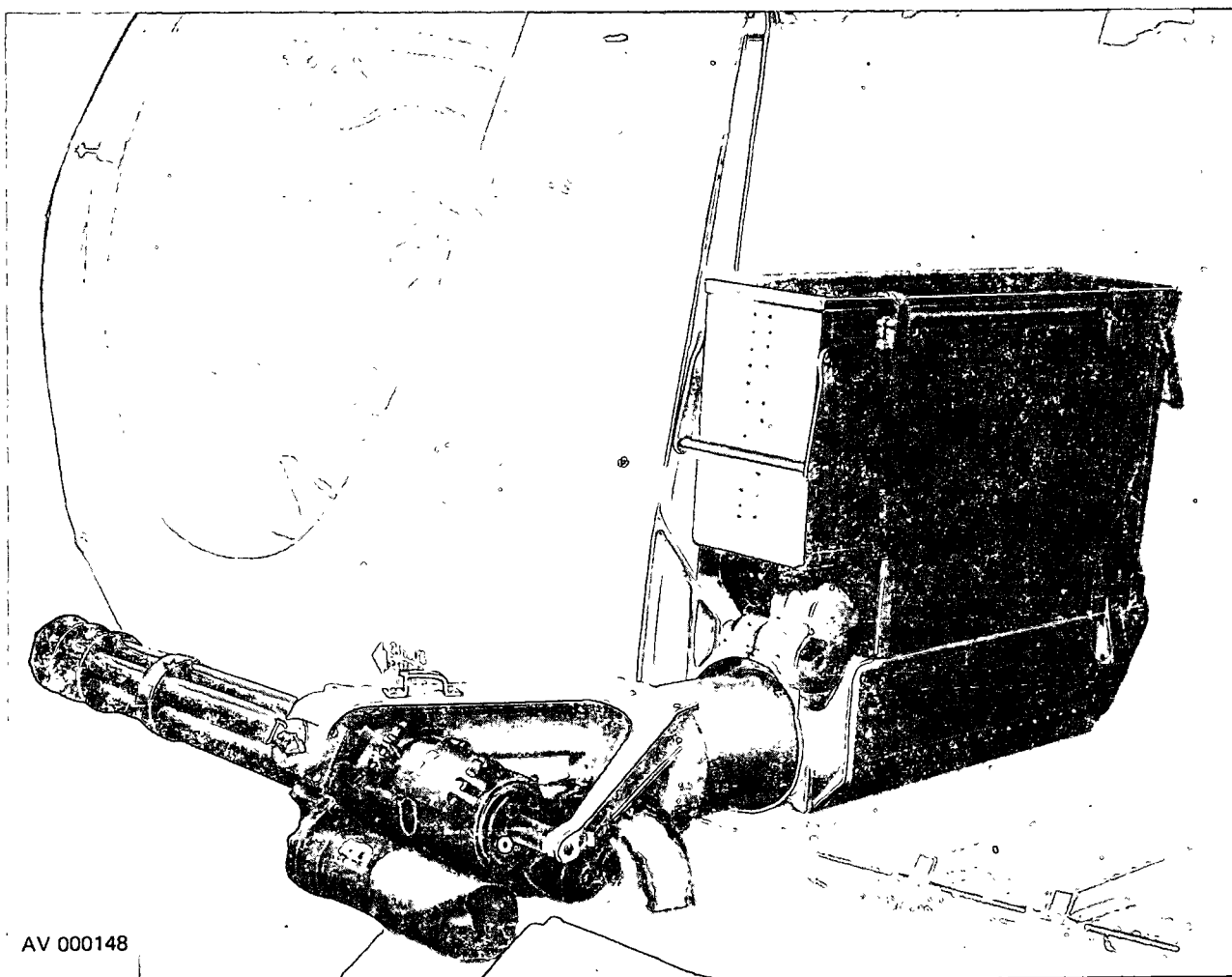


Figure 2-14. XM27E1 Armament subsystem with fairing removed

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2-12. M28A1 Armament Subsystem.

Armament Subsystem: M28A1

Aircraft series: AH-1G

Costs:

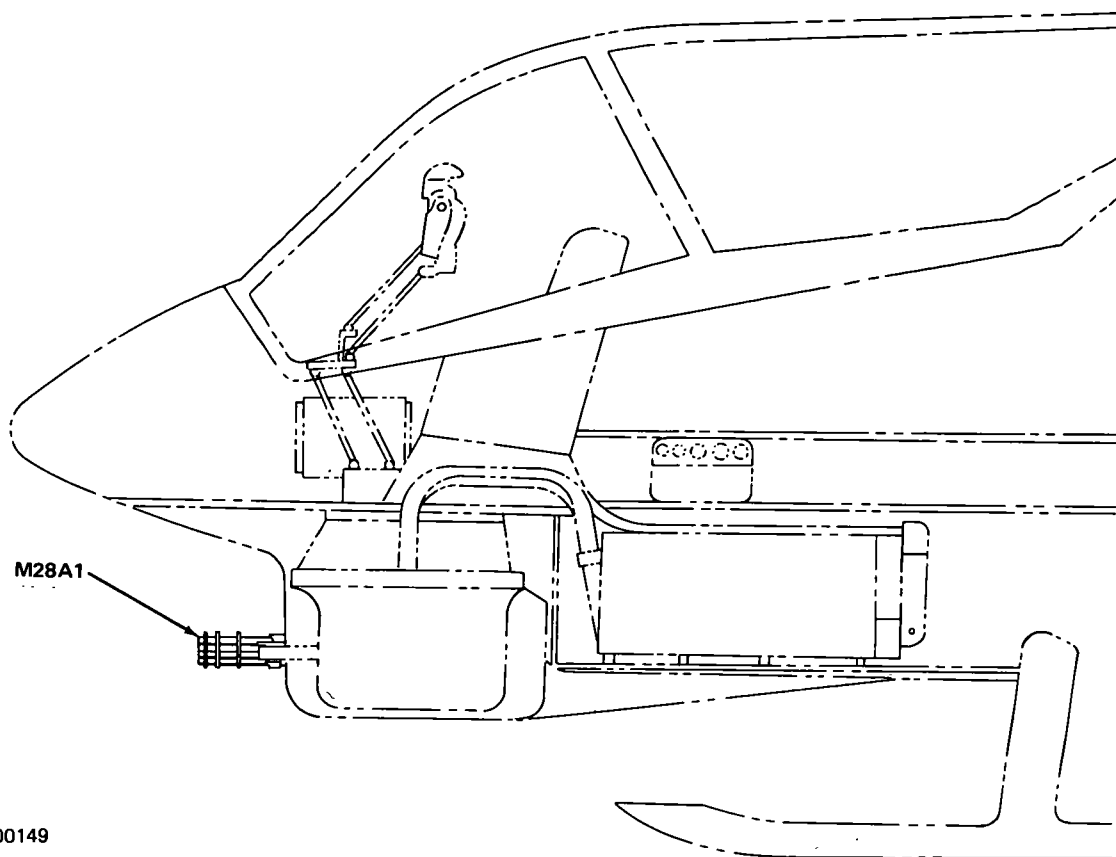
Acquisition — \$60,000

Type classification: STD A

Nomenclature: Armament subsystem, helicopter, 7.62-millimeter machinegun, 40-millimeter grenade launcher: M28A1.

Description: The M28A1 Armament subsystem consists of two high-rate, 7.62-millimeter automatic guns M134 or two 40-millimeter grenade launchers M129 or one of each mounted side by side in a flexible nose turret. Separate ammunition feed systems for each weapon contain 4000 rounds of 7.62 millimeter ammunition and 300 rounds of 40-millimeter grenades. The M-134 is controlled for a low or high-rate of fire, the M-129 fires approximately 400 rounds per minute. Turret traversing is controlled by the copilot using a flexible sight. Pilot can fire weapons in stowed mode using a fixed sight and maneuvering aircraft. Control panels at pilot and copilot stations provide for firing either weapon, but not both at same time, by either crewmember. These controls also control other external stores or weapons.

Remarks: This subsystem is in production.



AV 000149

Figure 2-15. M28A1 Armament subsystem

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2-13. XM35 Armament Subsystem

Armament Subsystem: XM35

Aircraft Series: AH-1G

Costs:

Acquisition — \$28,000

Type Classification: LP

Nomenclature: Armament Subsystem, Helicopter, XM35

Description: The XM35 Armament Subsystem consists of one 20 Millimeter automatic gun, XM195, mounted on the inboard stores mount of the left side of stub wing. An ammunition storage can is mounted to each side of the aircraft and connected by chuting to the gun. The gun is aimed by maneuvering the aircraft and fired by a trigger on the cyclic stick. The ammunition cans contain total of 950 rounds of linked 20 Millimeter ammunition. The gun fires at a rate of 750 rounds per minute.

Remarks: Current production contracts have been completed for XM35 Subsystems.

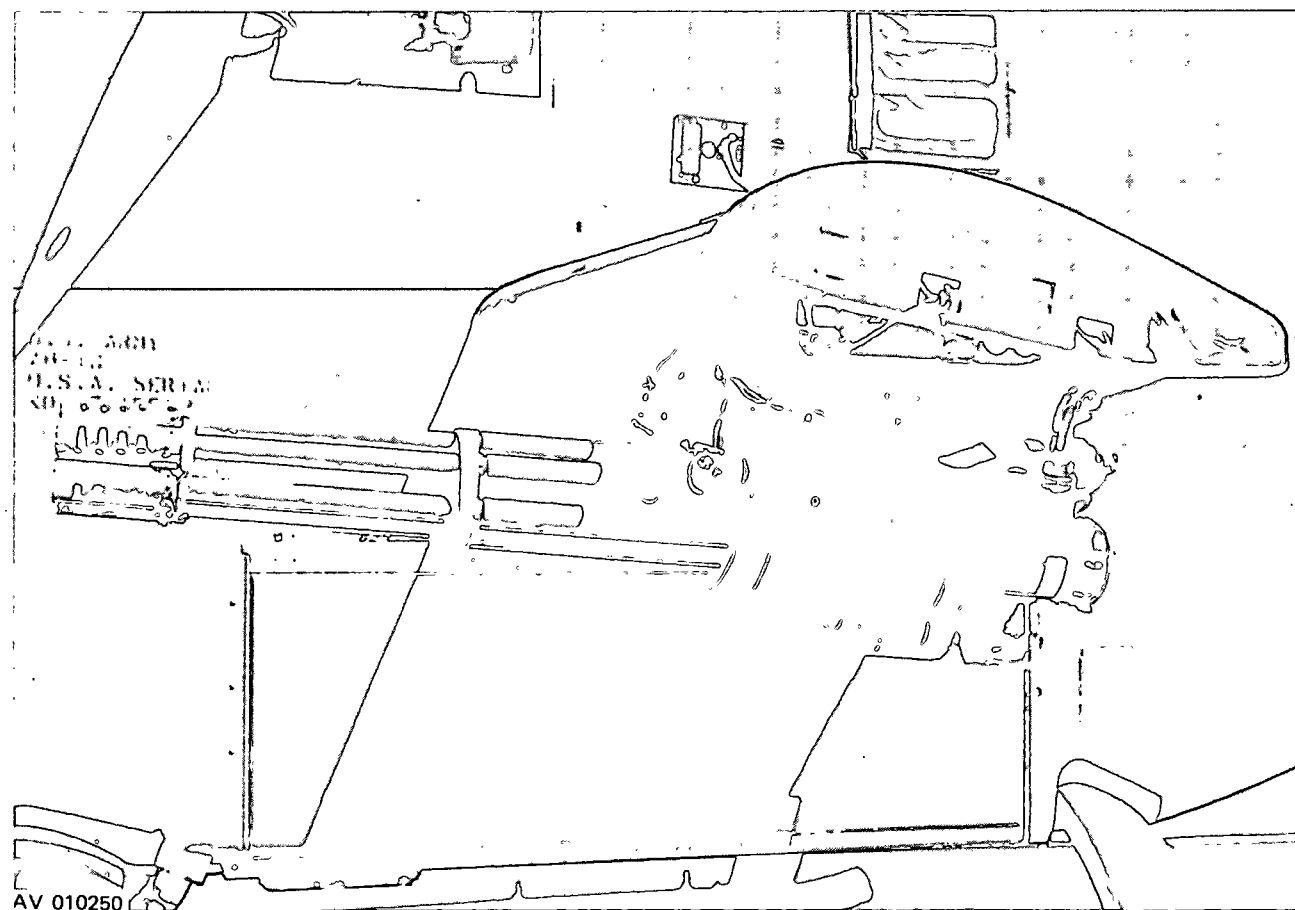


Figure 2-16. XM35 Armament subsystem

2-14. XM41 Armament Subsystem

Armament Subsystem: XM41

Aircraft Series: CH-47A/B/C

Costs:

Replacement — \$2,700

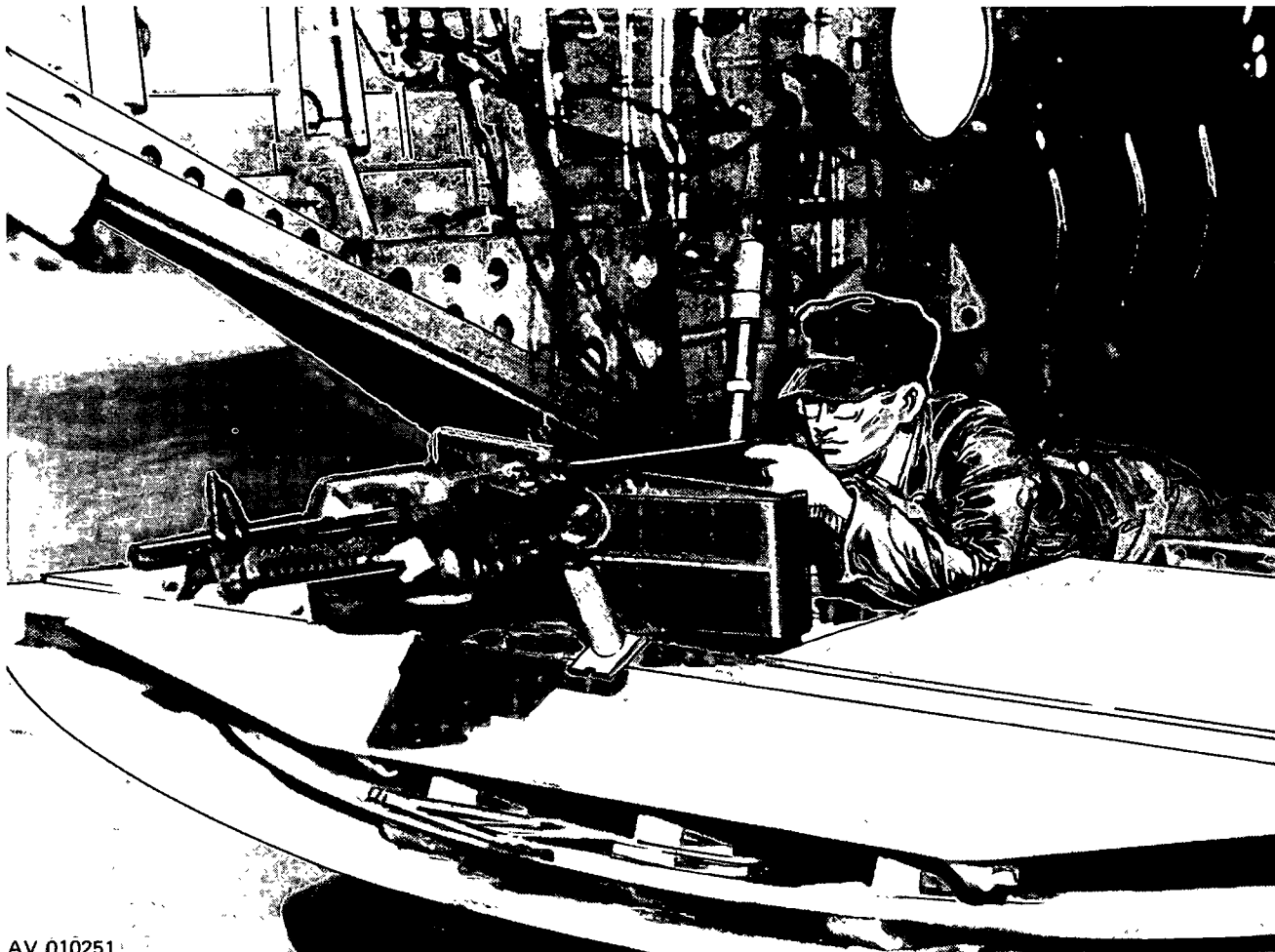
Type Classification: LP

Nomenclature: Armament Subsystem, Helicopter, 7.62 Millimeter Machine Gun: Ramp Mounted, Lightweight, XM41

Description: The XM41 Armament Subsystem consists of one flexible, 7.62 Millimeter Machine Gun, M60D, mounted on a post-and-pintle type mount. The mount secures to a bracket on the rear loading ramp of the helicopter. The gun is fired by a gunner lying on the loading ramp. Guns are held in stowed position by a shock cord assembly attached to the mount. An ammunition can assembly holding the boxes of 100 linked rounds each is attached to the left side of each gun. Gun firing rate is 550 rounds per minute. Spent cartridges are caught in an ejection control bag on the right side of each gun.

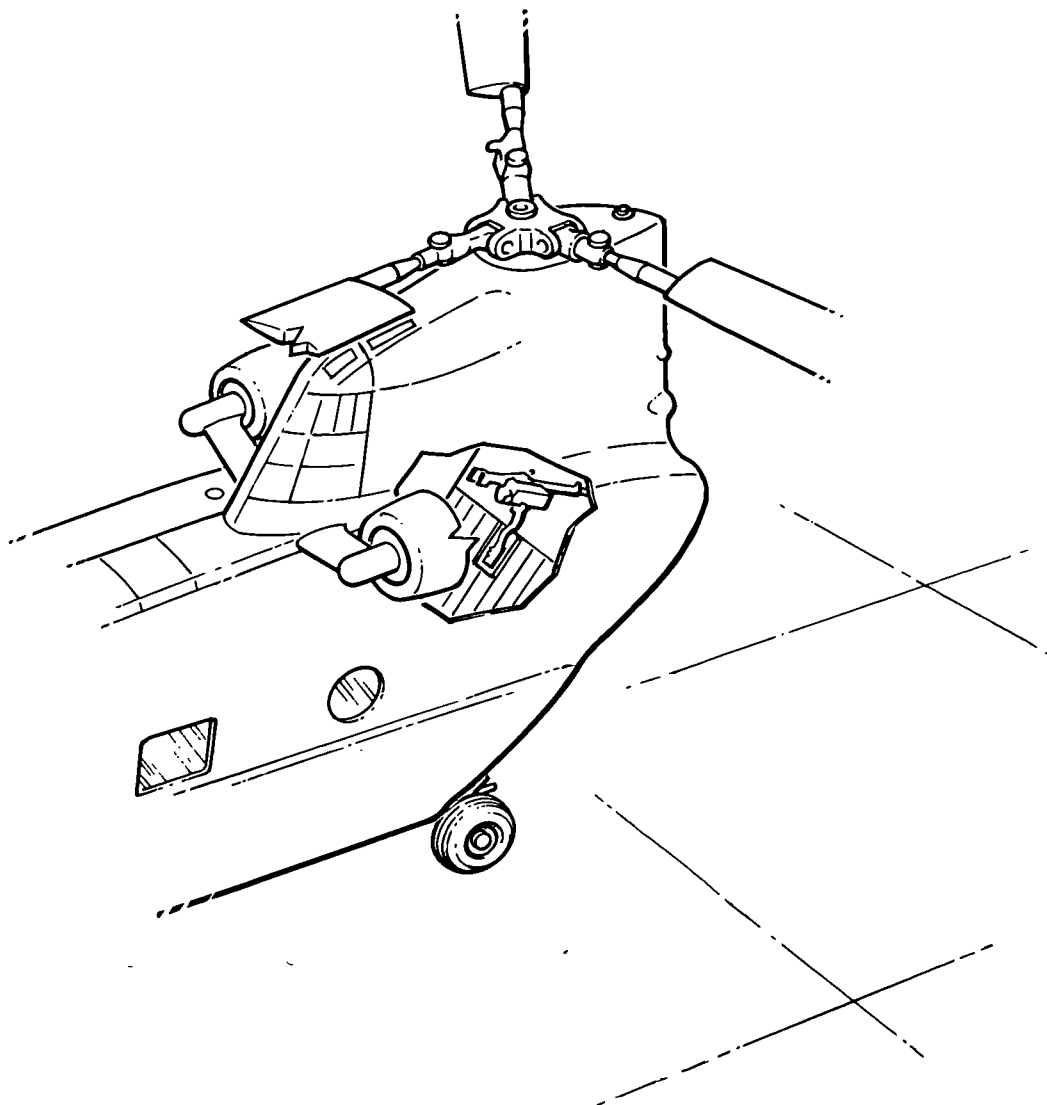
Remarks: Production contracts for the XM41 Armament Subsystem have been completed.

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AV 010251

Figure 2-17. XM41 Armament subsystem



AV 010252

Figure 2-18. XM41 Armament subsystem

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2-15. XM59 Armament Subsystem

Armament Subsystem: XM59

Aircraft Series: UH1-D/H

Costs:

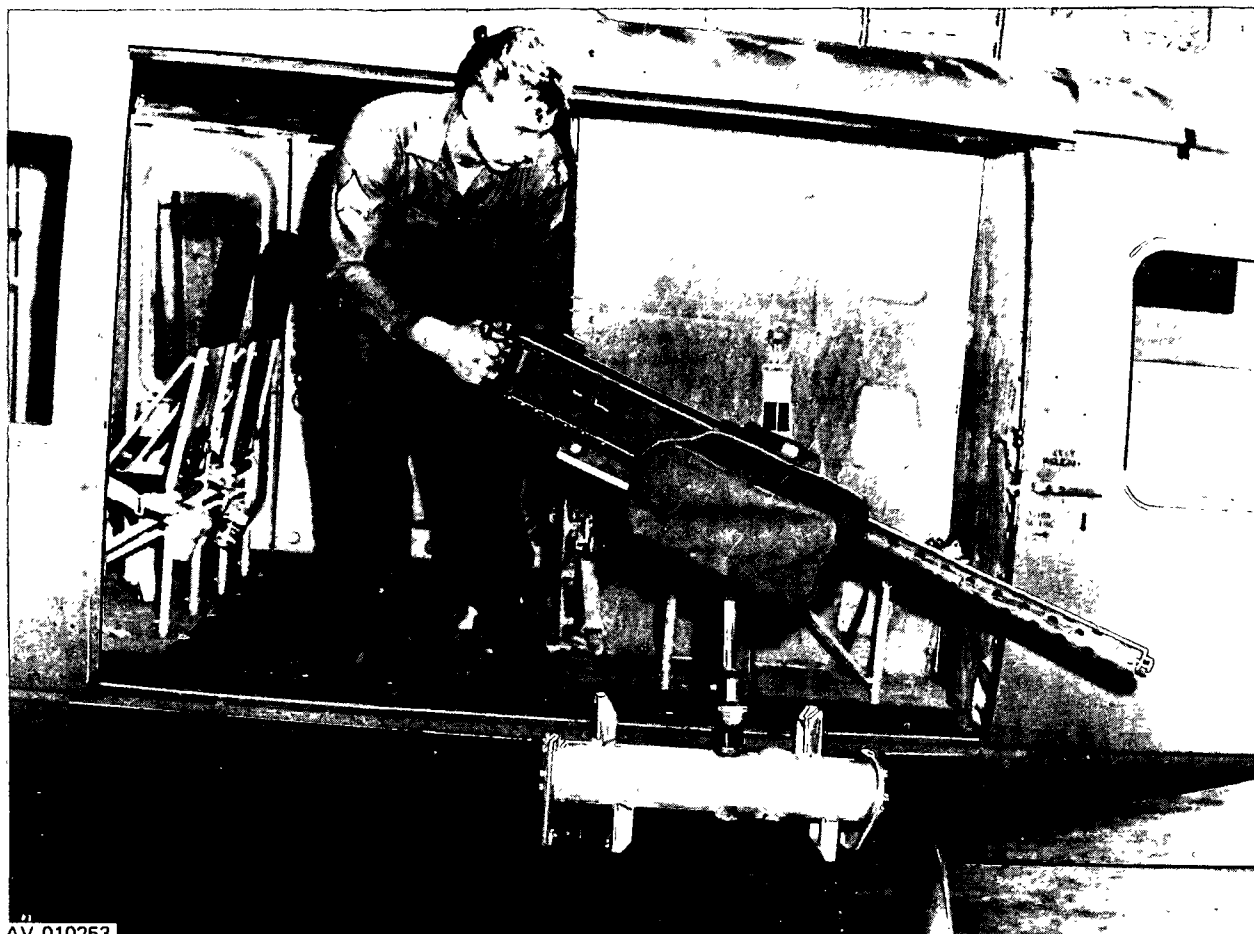
Acquisition – \$3,250

Type Classification: ENSURE

Nomenclature: Armament Subsystem, Helicopter, 7.62 Millimeter Machine Gun Caliber .50 Machine Gun: Door Mounted, XM59

Description: Armament Subsystem XM59 consists basically of the major components of Armament Subsystem N23 and a modified Caliber .50 Machine Gun AN-M2, an ammunition tray assembly, a bag and frame assembly (spent links only), a cradle assembly, a brass deflector, a pintle post assembly, two armament subsystem XM59 identification plates, and miscellaneous attaching hardware. 7.62MM Machine Gun M60D, mounted on its pintle post assembly, is installed on one side of the helicopter and one caliber .50 Machine Gun, AN-M2, is installed on the other side. The base tubes assemblies are interchangeable, allowing for installation of Machine Gun M60D or Machine Gun AN-M2 on either side of the helicopter. The guns are centrally positioned above the cargo deck and are manually operated by an operator/crew gunner. The guns can be elevated, depressed or traversed within specified limits. One forward beam, one aft beam and one base tube assembly (parts of M23 mount assy) are utilized when installing the Cal .50 Machine Gun AN-M2 portion of the XM59 Subsystem. Fires 700 rounds per minute.

Remarks: Current production contracts have been completed for the XM59 subsystems.



AV 010253

Figure 2-19. XM59 Armament subsystem (Cal. .50 MG installation shown)

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2-16. XM156 Armament Mount.

Armament mount: XM156

Aircraft series: UH-1B/C/M

Costs:

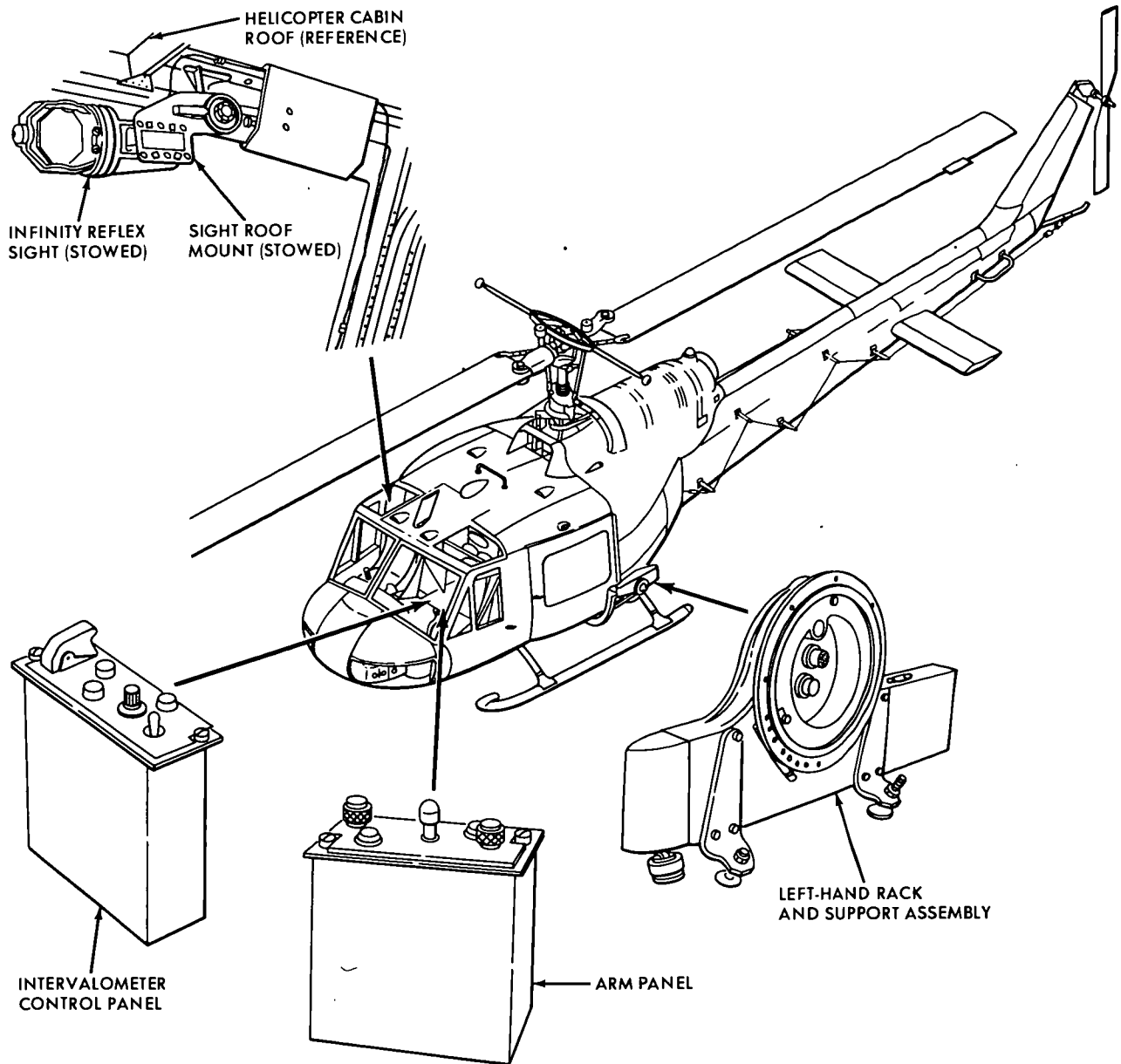
Replacement: \$8,977

Type classification: LP

Nomenclature: Mount, multi-armament, helicopter: XM156

Description: The XM156 Armament mount consists of two rack and support assemblies, as used in the M21 subsystem, installed on right and left sides of aircraft. The rack and support assemblies have been extended, to carry larger diameter external stores. The racks contain MA4A bomb racks with 14-inch hook spacing to carry all compatible stores with 14-inch lug spacing. An intervalometer and an arming panel are installed in the helicopter console along with reflex sight XM60. The mount is designed to carry and fire 7-tube rocket launchers XM159/XM200 or tube rocket launchers XM159/XM200.

Remarks: Production contracts for XM156 armament mount have been completed.



AV 000152

Figure 2-20. XM156 Armament subsystem components

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2-17. M158A1 2.75" Rocket Launcher (&-Tube).

Rocket Launcher: M158A1

Aircraft Series: UH1B/C AH1G

Costs:

Acquisition — \$382

Replacement — \$382

Type Classification: STD A

Nomenclature: Launcher, Rocket Aircraft, 2.75 Inch — M158A1 (7-Tube)

Description: The M158A1 is a repairable 7-tube 2.75 inch rocket launcher used on the UH1B/C and AH1G Aircrafts. It is 58 inches long and weighs 48 lbs. It can be loaded from either end.

Remarks: TOE Authorization — not available this printing.
Predicted year end assets: FY 1972 2,510

Basis of Issue: Approved BOI not available.
For planning purposes:
2 each per UH1B armed with M21 Subsystem
1 each per AH1G aircraft (all)



AV 000196

Figure 2-21. Launcher, rocket aircraft, 2.75 inch-M158A1 (7-Tube)

2-18. M200A1 2.75" Rocket Launcher (19-Tube).

Rocket Launcher: M200A1

Aircraft Series: UH1B/C

AH1G

Costs:

Acquisition — \$681.00

Replacement — \$681.00

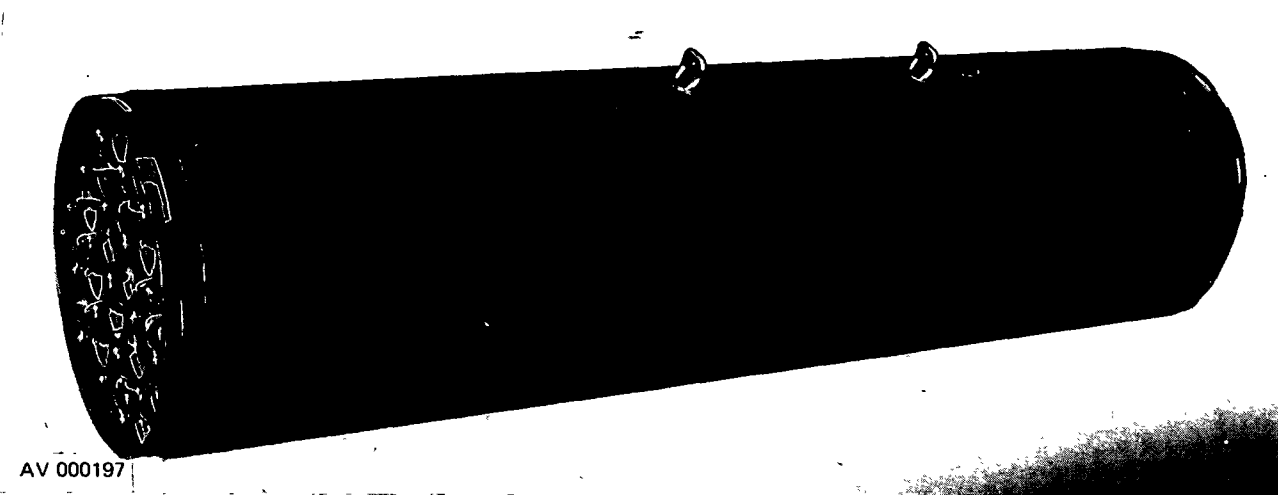
Type Classification: STD A

Nomenclature: Launcher, Rocket Aircraft, 2.75 inch M200A1

Description: The M200A1 is a 19-tube repairable 2.75 inch rocket launcher, used on the UH1B/C, and AH1G Aircrafts. It is 60.6 inches long and weighs 139 lbs. It can be loaded from either end, however, for reasons of safety where static electricity and/or electromagnetic radiation exists, front loading only is recommended.

Remarks: TOE Authorizations — not available this printing
 Predicted year end assets: FY 1972
 2200

Basis of Issue: Approved BOI not available.
 For Planning Purposes.
 2 each per UH1B/C equipped with XM156 mount
 3 each per AH1G aircraft



AV 000197

Figure 2-22. Launcher, rocket aircraft, 2.75 inch M200A-1 (19-tube)

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2-81/(2-82 blank)



2-20. Aircraft Armor Systems.

Armor protection against enemy small arms fire is provided for Army aircraft crew and critical components. Types of crew protection include armored seat

bottoms, side panels, and floor plates. Protection of critical components is provided by means of armor for engine, fuel and oil accessories, and flight control items. The amount and placement of protective armor varies among different types of aircraft systems.

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2-20. Aircraft Armor Systems (CONT).

AIRCRAFT	SYSTEM	ARMOR WEIGHT	MATERIAL	PART NO.	FSN
AH-1G	Crew and component protection	267.6 lb/acft	B ₄ C with Fiberglass Backing	N/A - Furnished with aircraft and not available in kit form.	
CH-34C	Crew protection	203 lb/acft	Al ₂ O ₃ with Fiberglass Backing	20064374	None
CH-34C	Component protection	217 lb/acft	Case Hardened Steel	S1607-2256-2	1560-918-0691
CH-47A	Crew protection (Aerosmith seat)	234 lb/acft	Al ₂ O ₃ with Fiberglass Backing	1560-CH47-225	1680-912-3944
CH-47A/B/C	Crew protection (Alsco seat)	139 lb/acft	Al ₂ O ₃ with Fiberglass Backing	1560-CH47-300	1680-947-9829
CH-47A/B	Component protection	491 lb/acft	DPS and Fire Suppression Foam	113550-3	1560-945-4828
CH-47C	Component protection	510 lb/acft	DPS and Fire Suppression Foam	113759-2	1560-725-6073
CH-54A	Crew and component protection	1164 lb/acft	B ₄ C with Fiberglass and DPS	6407-75100-013	1680-073-8396
CH-54B	Crew and component protection	1233 lb/acft	B ₄ C with Fiberglass and DPSA	N/A - Furnished with aircraft and not available in kit form.	
OH-6A	Crew and component protection	119 lb/acft	B ₄ C with Fiberglass Backing and DPS	1560-OH6-000-3	1560-133-8381
OH-13	Crew protection	45 lb/acft	B ₄ C with Fiberglass Backing	1680-OH13-013-1	1680-939-7796
OH-23	Crew protection	48 lb/acft	B ₄ C with Fiberglass Backing	1560-OH23-418-1	1680-923-4064

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2-20. Aircraft Armor Systems (CONT).

AIRCRAFT	SYSTEM	ARMOR WEIGHT	MATERIAL	PART NO.	FSN
OH-58A	Crew and component protection	112 lb/acft	B ₄ C with Fiberglass Backing	N/A - Furnished with acft and not available in kit form.	
UH-1B/C/D/H/M	Crew protection	210 lb/acft	Al ₂ O ₃ with Aluminum Backing	178061-3 and 178062-3	1680-933-9384 and 1680-933-9385
UH-1B/C/D/H/M	Gunner protection	46 lb/acft	Al ₂ O ₃ with Aluminum Backing	1560-UH1-350-1	1680-067-8208
O-1	Crew protection	55 lb/acft	B ₄ C with Fiberglass Backing	1560-01-198-1	1680-943-0746
OV-1A/B/C	Crew protection consisting of combinations of: (1) Nose armor, KA-60 camera provisions 63 lb/acft (2) Nose armor, SLAR provisions 53 lb/acft (3) Nose armor, without KA-60 and SLAR provisions 65 lb/acft (4) Side armor, homing antenna provisions 21 lb/acft (5) Side armor, without homing antenna provisions 19 lb/acft (6) Side armor, side panel with circuit breaker panel aft center right panel 24 lb/acft (7) Side armor, side panel without circuit breaker panel 25 lb/acft (8) Side armor, side panel common to all aircraft 68 lb/acft (9) Extended side armor and floor armor on OV-1A and OV-1C, 181 lb/acft		Al ₂ O ₃ with Fiberglass Backing	1560-OV1-120-1 1560-OV1-121-1 1560-OV1-122-1 1560-OV1-123-1 1560-OV1-124-1 1560-OV1-125-1 1560-OV1-126-1 1560-OV1-127-1 1560-OV1-006-1	1560-947-3446 1560-947-3447 1560-947-3448 1560-947-3451 1560-947-3452 1560-947-3453 1560-947-3449 1560-947-3450 1560-943-0754

Al₂O₃ - Aluminum oxide composite armor
B₄C - Boron carbide composite armor

SiC - Silicon carbide
DPS - Dual property steel armor

Source: AMSAV-R-EGGA

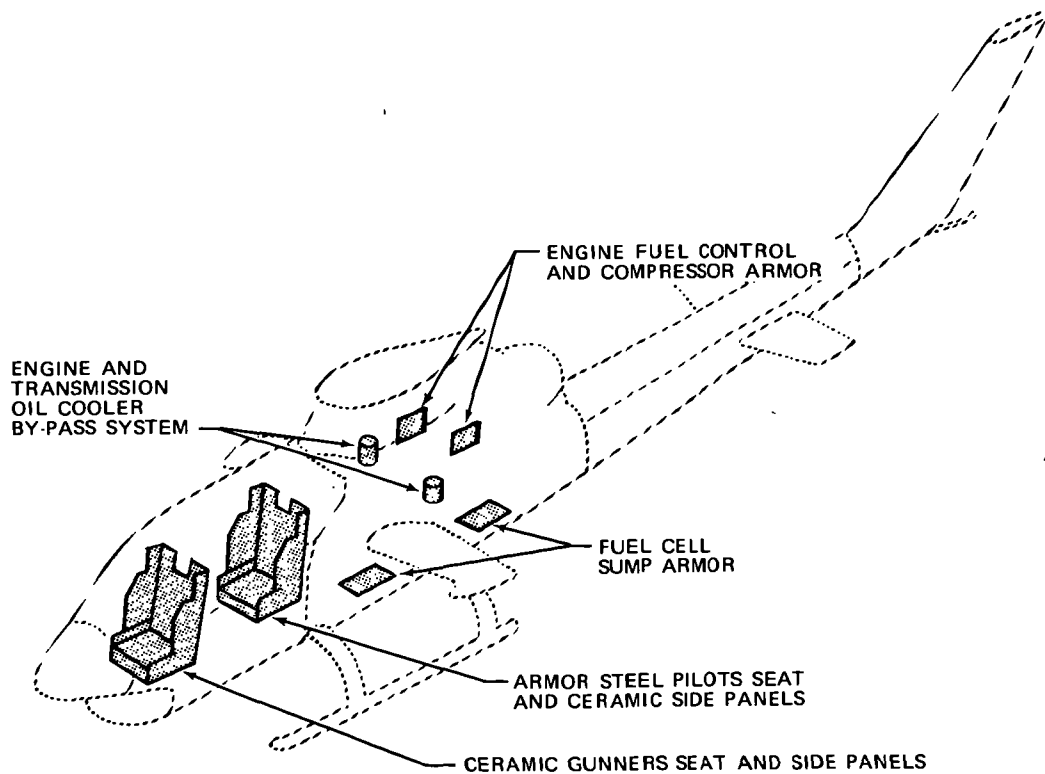
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FM 101-20-1

• 2-21. AH-1G Armor.

a. The AH-1G aircraft are provided with aircrew and critical component armor. The pilot's seat is made of dual hardness steel armor. The fixed side panels are made of a hard faced composite material. The entire passive defense system for the gunner is made of a hard faced composite material.

b. Critical component armor is located on each side of the engine to protect the engine compressor section and the fuel control unit. The fuel cells are self-sealing as follows: Bottom 33% capacity against .50 caliber, center 33% capacity against .30 caliber, and the top 34% is not self-sealing. The fuel crossover line is self-sealing.



AV 000216

Figure 2-23. AH-1G Armor

2-22. CH-47 Armor.

a. The CH-47 aircraft are provided with aircrew and critical component armor.

b. The aircrew armor material is aluminum oxide hard faced composite capable of defeating .30 caliber projectiles.

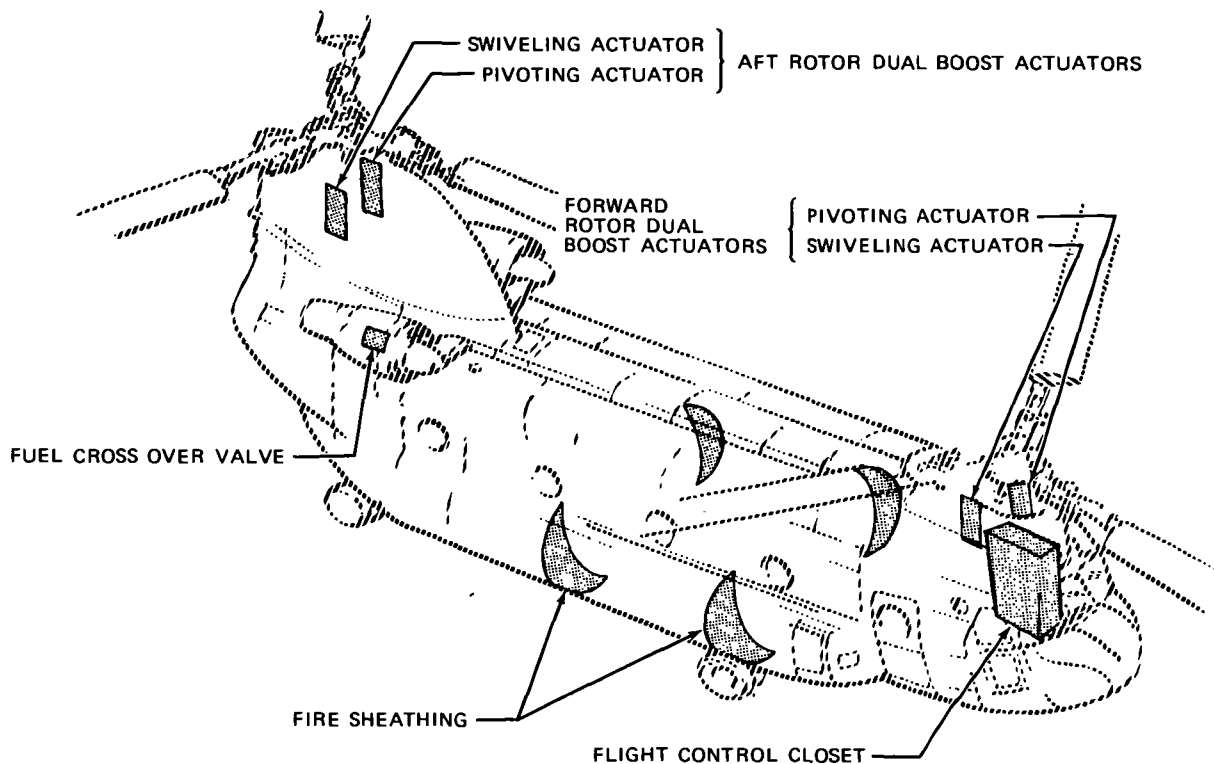
c. DPS armor has been provided for the following critical components:

(1) Armor for the fore and aft flight control actuators in four locations.

(2) Armor for the flight control closet.

(3) Armor for the fuel crossover valve.

(4) Fire suppression foam on fore and aft faces of both fuel tanks.



AV 000217

Figure 2-24. CH-47 Armor

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2-23. Armor for the Armed and Armored Chinook.

a. Armor for the armed and armored Chinook consists of aircrew and component armor. The pilot and copilot have been provided with a crash attenuating integral .30 caliber armor seat.

b. The total installed weight of the armor system is 2700 pounds. Armor is provided for the following critical components:

(1) Controls closet area of flight controls system.

(2) Swiveling and pivoting dual actuators in forward and aft pylons.

(3) Copilot's control box.

(4) Linkage from copilot's controls to closet.

(5) Flight controls mix complex.

(6) Walking beam rod ends and bellcrank.

(7) Aft fuselage controls, rods, and bellcrank.

(8) Aft pylon controls, rods, and bellcrank.

(9) Accessory gear box, Quill shaft.

c. The armor material is dual property steel capable of defeating .50 caliber API projectiles.

2-24. CH-54A Armor.

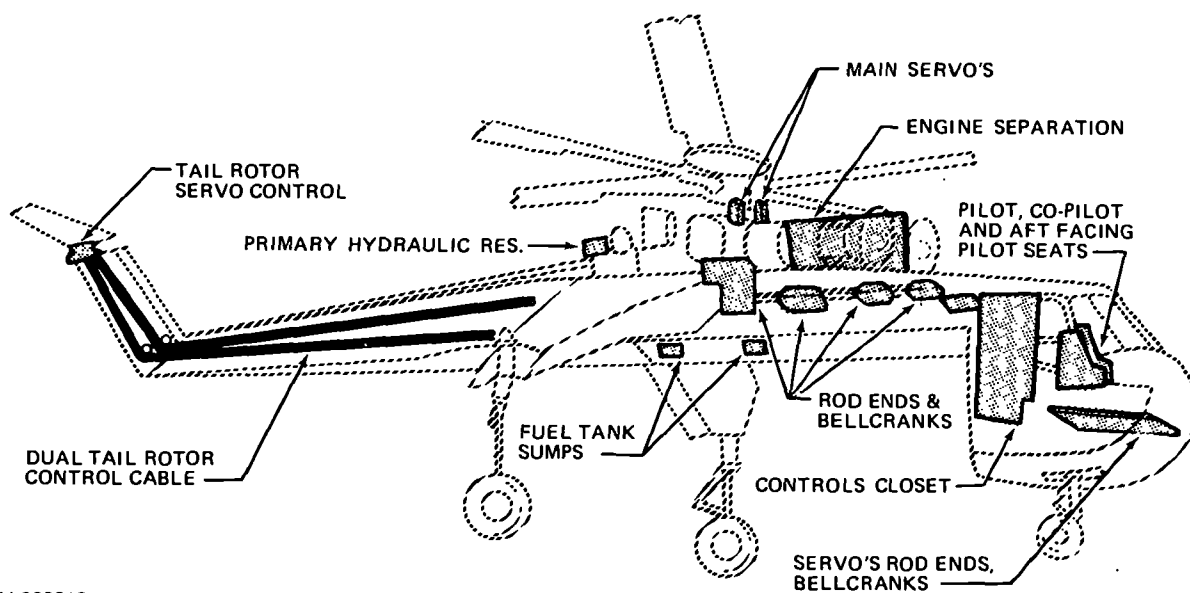
a. The CH-54A aircraft are equipped with aircrew and critical component armor. The pilot, copilot, and aft facing pilot are provided with armor placed on and around the existing seats. Protection is provided for the back, bottom, and sides. Frontal protection is via chest protector.

b. The .30 caliber armor material is primarily a boron carbide hard faced composite with dual hardness steel protecting the rod ends and bellcranks on the transmission deck. The weight of the armor for the pilot's seat is 120 pounds, for the copilot's seat is 111 pounds, and for the aft facing pilot's seat is 86 pounds. Armor is provided for the following critical components:

(1) Servos, rod ends, and bellcranks under the pilot's floor.

- (2) Controls closet.
- (3) External rod ends and bellcranks.
- (4) Armored panel between the engine for separation purposes.
- (5) Main servos.
- (6) Primary hydraulic reservoir.
- (7) Fuel tank sumps.
- (8) Tail rotor servo control.
- (9) Incorporation of a dual tail rotor control cable.

c. Total increase in aircraft weight is 1167 pounds.



AV 000218

Figure 2-25. CH-54A Armor

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2-25. OH-6A Armor.

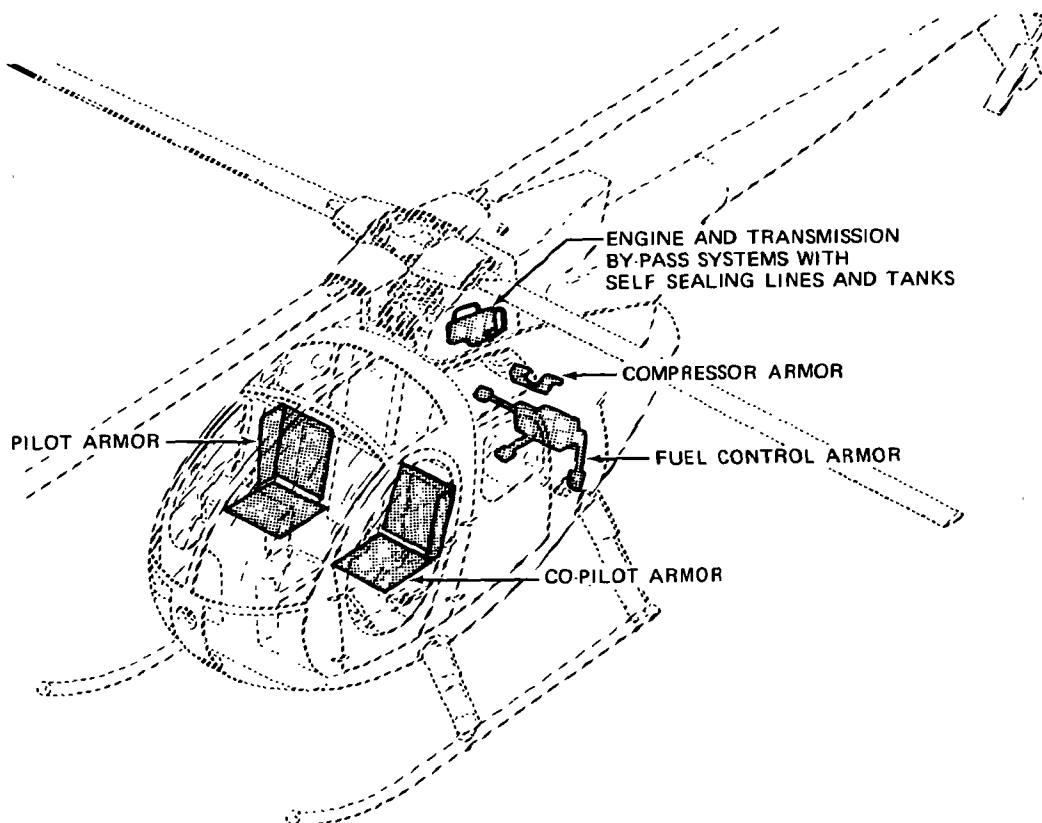
a. The passive protection system for the OH-6A aircraft consists of aircrew and critical component armor. The pilot and copilot is provided with armor placed on the existing seats. Protection is provided for the back, bottom, and sides. Frontal protection is via chest protector.

b. The armor material is a .30 caliber boron carbide hard faced composite except for the panel under the seat and the engine compressor panel which are of dual property steel.

c. The weight of the complete installed system is 130 pounds.

d. Armor is provided for the following critical components:

- (1) Engine compressor.
- (2) Self-sealing oil lines.
- (3) Self-sealing fuel lines.
- (4) Engine and transmission oil cooler bypass valves.
- (5) Fuel control valve.



AV 000219

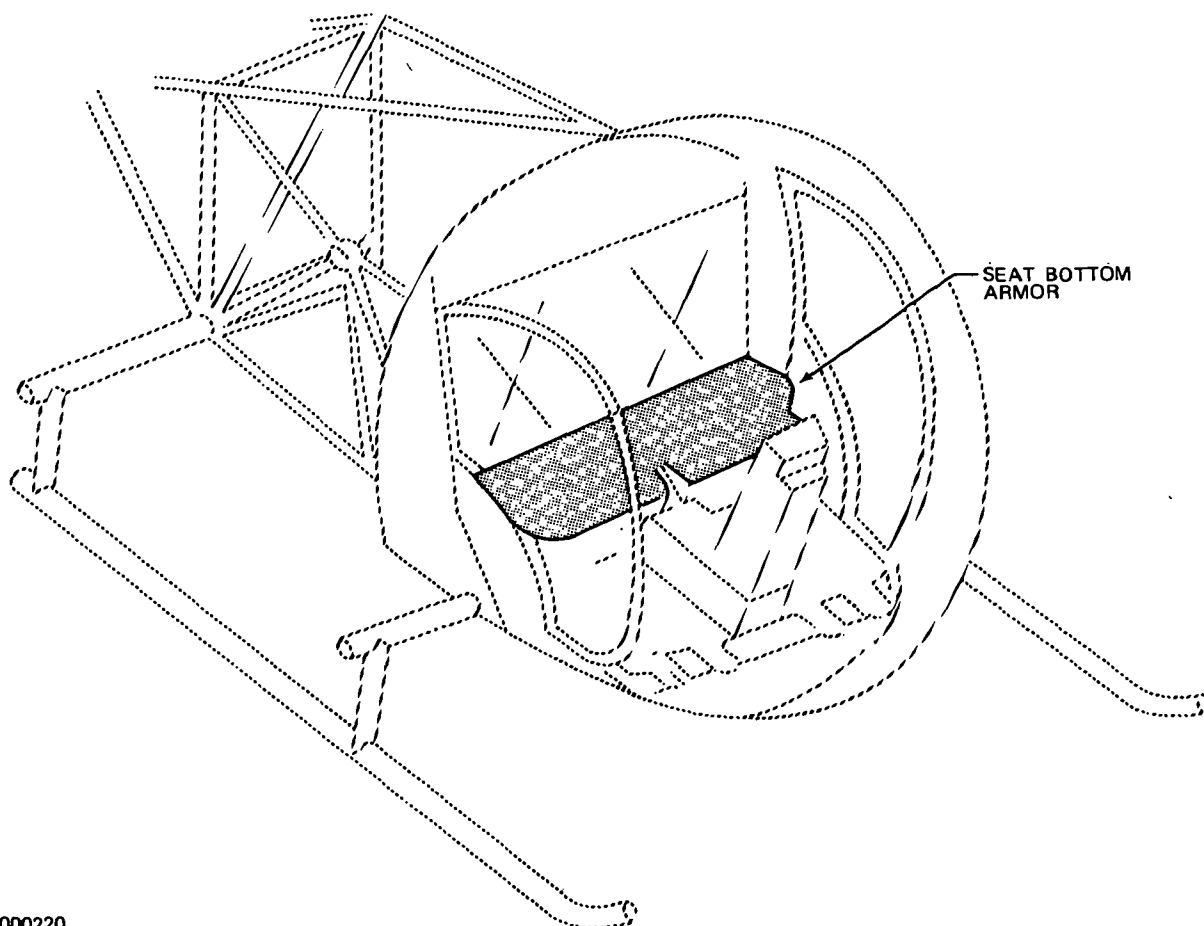
Figure 2-26. OH-6A Armor

2-26. OH-13 Armor.

a. The OH-13 aircraft are equipped with aircrew armor for the pilot, copilot, and observer. The armor protection consists of two flat plates which are installed under the aircraft seat cushions. The system was

designed to protect the crew members wearing the Natick developed front and back protector.

b. The material used for the aircrew armor is a .30 caliber, hard faced composite (HFC). The weight of the armor system is 45 pounds.



AV 000220

Figure 2-27. OH-13 Armor

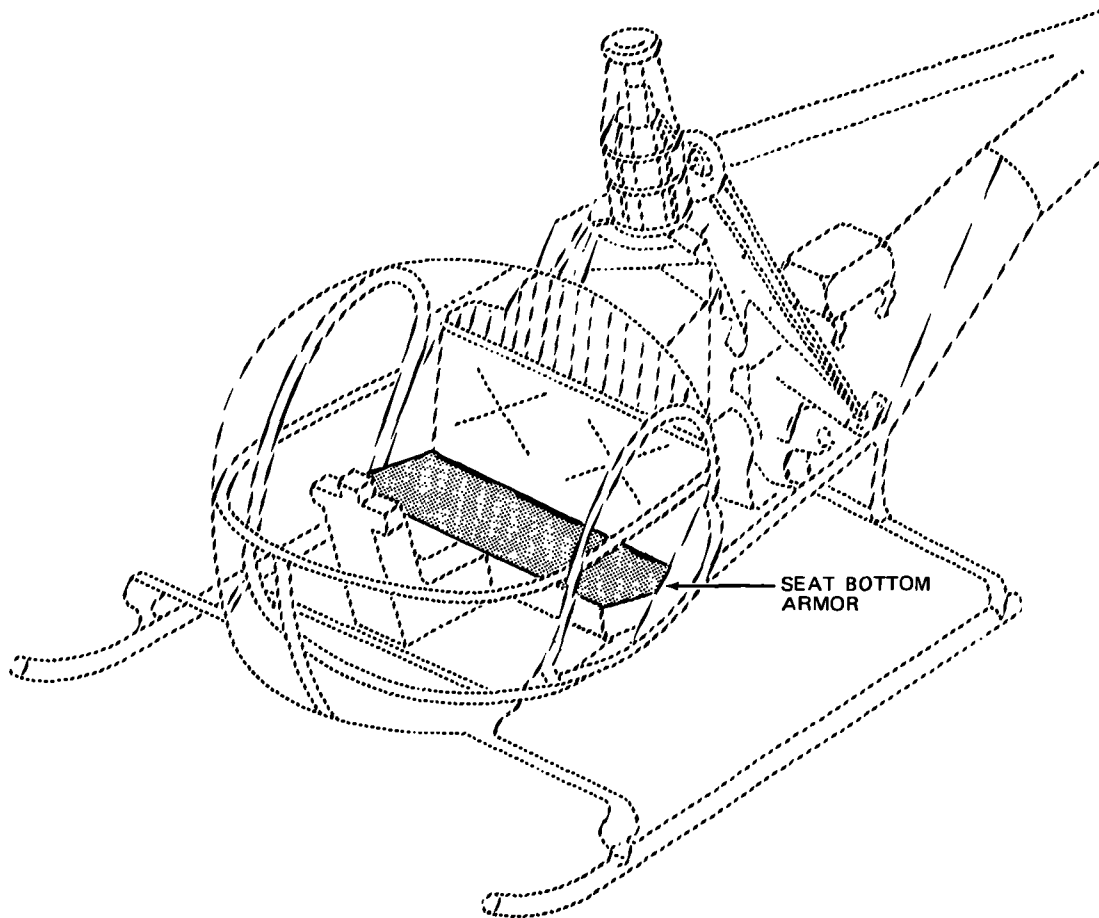
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2-27. OH-23 Armor.

a. The OH-23 aircraft are equipped with aircrew armor for the pilot, copilot, and observer. The armor protection consists of two flat plates which are installed under the aircraft seat cushions. The system was

designed to protect the crew members wearing the Natick developed front and back protector.

b. The material used for the aircrew armor is a .30 caliber, hard faced composite (HFC). The weight of the armor system is 48 pounds.



AV 000221

Figure 2-28. OH-23 Armor

2-28. UH-1B, C, D Armor.

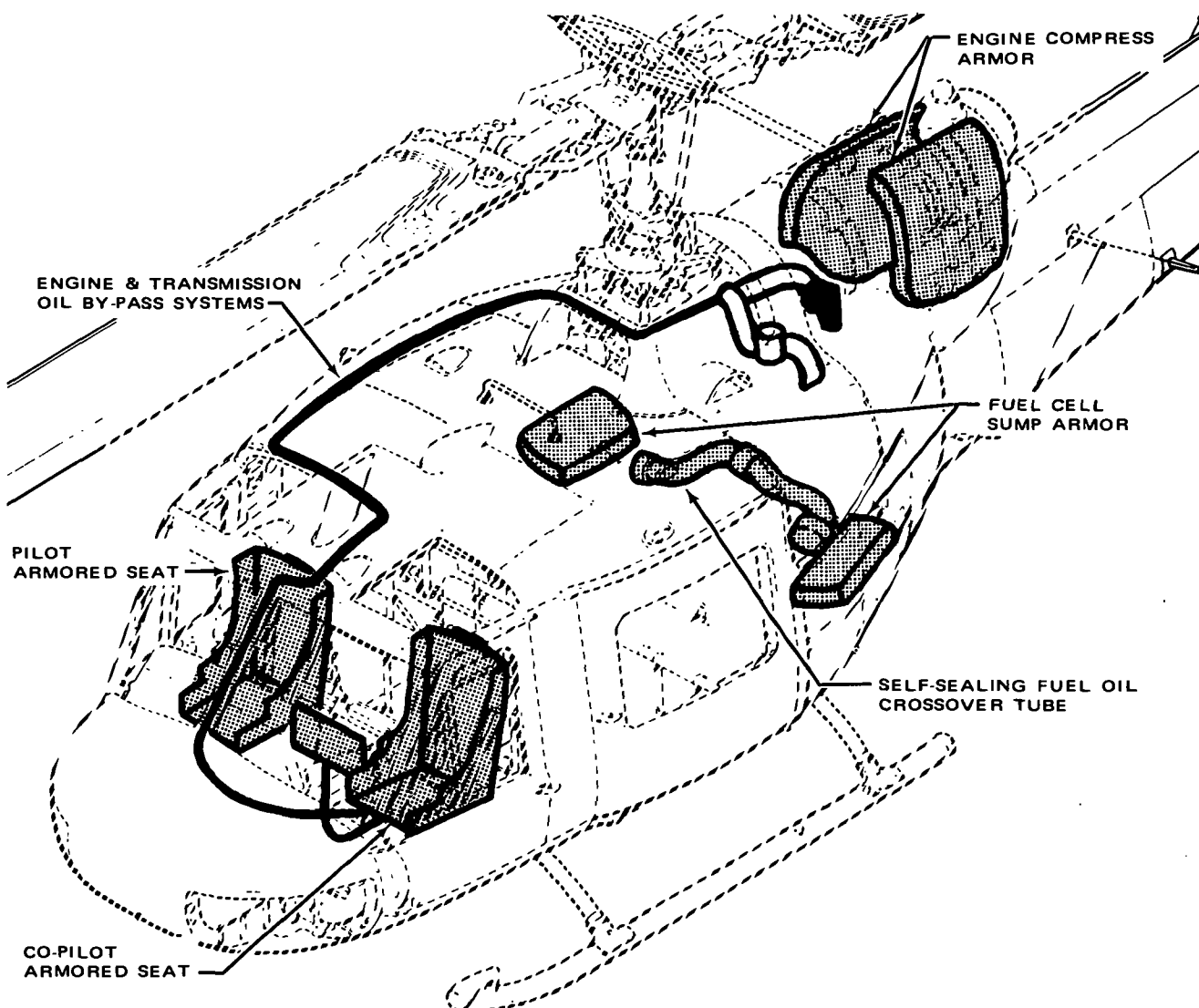
a. The UH-1 series aircraft are equipped with aircrew armor for the pilot and copilot. The armor consists of an integrated armored seat. Protection is provided from the bottom, rear, and sides. Frontal protection is via chest protector.

b. The armor material is aluminum oxide hard faced composite capable of defeating .30 caliber projectiles.

c. The headguard is an armor panel which attaches to the back of the seats. The gunner's seat armor unit is a plate of armor material securely fastened to the crew seats in the UH-1. It is provided with a cushion for the crewman to sit on.

d. Armor has been provided for the following critical components:

- (1) Fuel cell sumps.



AV 000222

Figure 2-29. UH-1 Armor

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(2) Vithane for the fuel cell crossover tube.

(3) Vithane for the engine and transmission oil coolers.

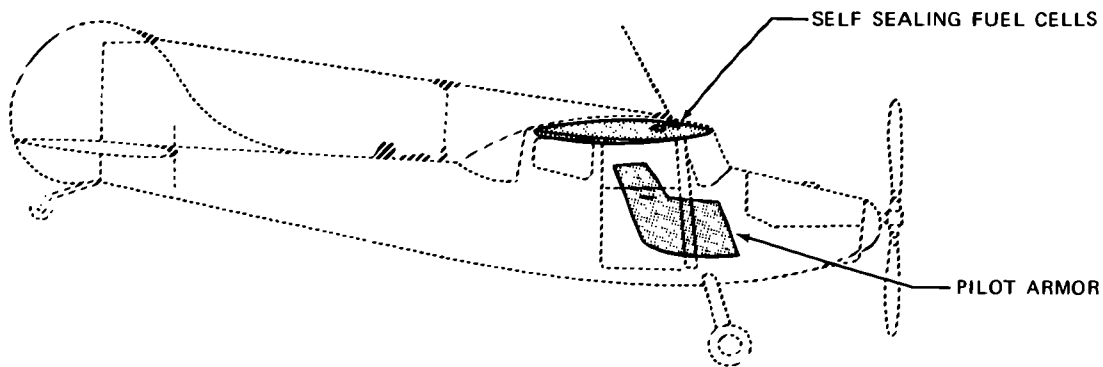
e. The armor material weight is 79 pounds for the hard faced composite.

both sides and on the seat back. The curved seat pan is removed and a dropped pan with armor provides protection from underneath the seat.

b. The material used for the pilot's seat armor is .30 caliber hard faced composite (HFC). The weight of the armor is 54 pounds.

2-29. O-1 Armor.

a. The O-1 aircraft are provided with pilot seat armor. The armor panels attach to the aircraft seat on



AV 000223

Figure 2-30. O-1 Armor

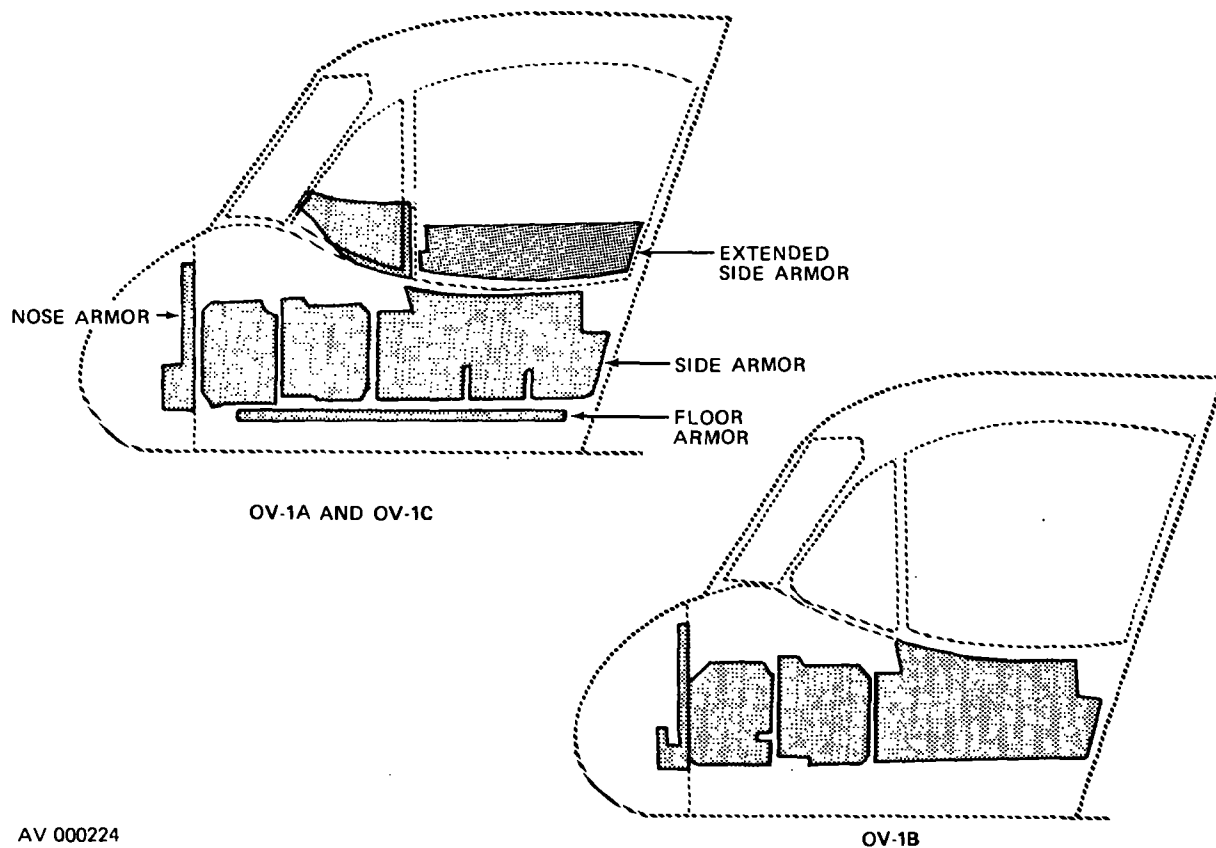
2-30. OV-1 Armor.

a. The OV-1 aircraft are provided with aircrew and critical component armor. The aircrew armor is located on the nose bulkhead cockpit sides, floor, hatch, and forward windows. This armor had to be mounted on the airframe since the ejection seat would not tolerate the weight.

b. The material used for aircrew armor is a .30 caliber aluminum oxide hard faced composite system. Critical component protection, which protects a hy-

draulic valve in the landing gear system, is dual property steel armor.

c. Due to the various aircraft and avionic configurations, different armor sub-kits are required for any one model. All OV-1A and OV-1C aircraft require five of these sub-kits, while the OV-1B requires only four. The extended side and floor armor sub-kit provided for the OV-1A and OV-1C is not used on OV-1B aircraft due to weight and balance considerations. Subsequently, the armor systems for the OV-1A and OV-1C model aircraft weigh 360 pounds as opposed to 180 pounds for the OV-1B.



AV 000224

Figure 2-31. OV-1 Armor

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Section III. FERRYING AND SHIPPING*

2-31. Surface Shipment.

Preparation of large numbers of aircraft for simultaneous mass movement by ocean transport had its inception in the latter part of June 1965.

Deployment of the 1st Cavalry Division (Air-mobile) involved movement of a large number of aircraft, which was a first of this type and magnitude for the U. S. Army. Since the operation involved movement of approximately 500 aircraft, staging areas

had to be established to receive, process, and marshall in accordance with the numbers designated for each of four vessels. Ports of loading were designated as Brookley Air Force Base, Mobile, Ala., and Mayport Naval Base, Jacksonville, Fla., plus "Spraylat" capability at Naval Air Station, Jacksonville, Fla.

As a result of the experience with the deployment of the 1st Cavalry Division, certain time factors for preparation were evolved. This experience has been used in developing the following table relating to processing Army aircraft for surface shipment.

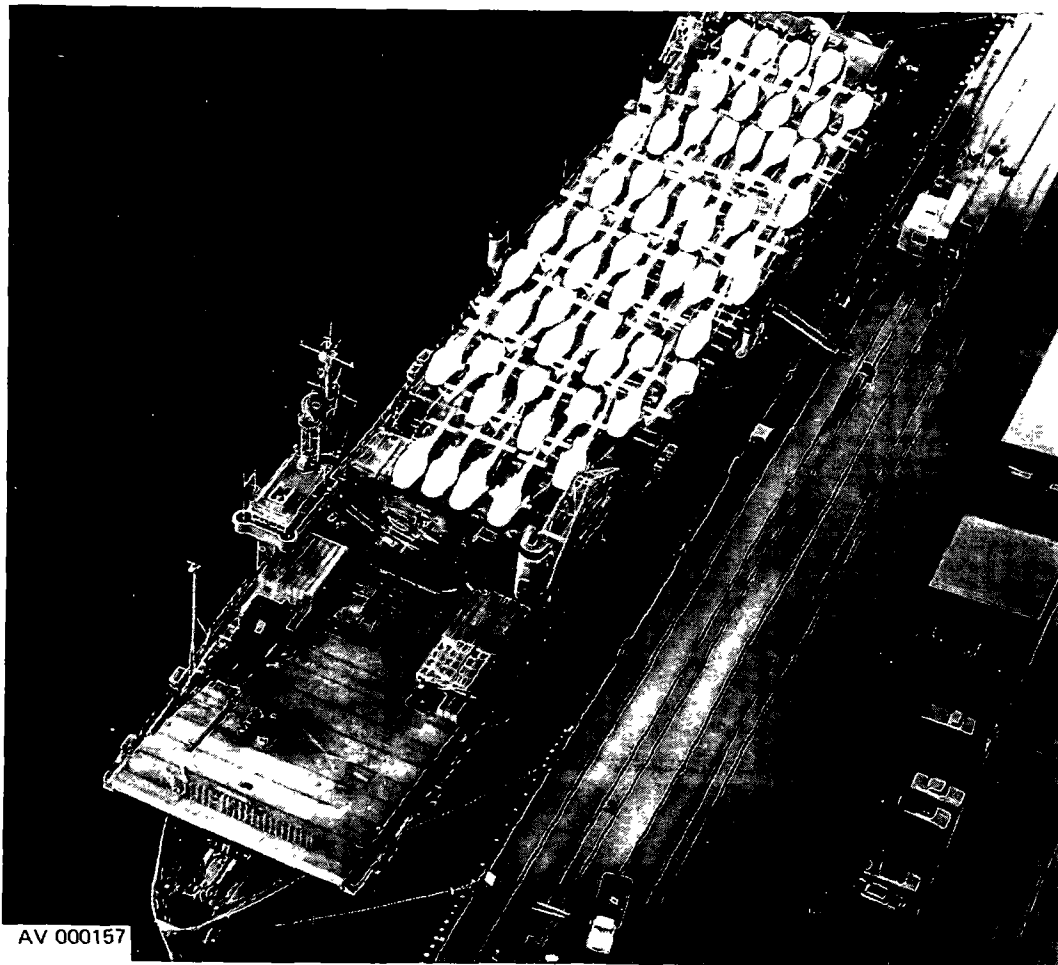


Figure 2-32. Aircraft loaded for surface shipment

* Source: AMSAV - R - MP

2-32. Surface Shipment Processing Time.

TYPE OF AIR- CRAFT	DIRECT LABOR (MAN-HOURS REQUIRED TO PROCESS FOR OVERSEAS SHIPMENT <u>2/</u>)				ELAPSED TIME TO PROCESS (HOURS)				MAN-HOURS (M/H) AND ELAPSED TIME (ET) TO DEPROCESS								REFER- ENCED PUB- LICATIONS
	TOP DECK LOADING		BELOW DECK LOADING		TOP DECK LOADING		BELOW DECK LOADING		BELOW DECK CRATED		BELOW DECK UN- CRATED		TOP DECK STRIP- PALE COAT- ING		TOP DECK REUS- ABLE COVERS		
	STRIP COAT- ING	REUS- ABLE COVERS	CRATED	UN- CRATED	STRIP COAT- ING	REUS- ABLE COVER	CRATED	UN- CRATED	M/H	ET	M/H	ET	M/H	ET	M/H	ET	
4/AH-1G	90	55	<u>3/</u>	50	30	24	<u>3/</u>	24			10	10	25	10	15	10	TM 1-AH-1-S
CH-34C	125	65 <u>1/</u>	<u>3/</u>	60	72	24	<u>3/</u>	24	<u>3/</u>	<u>3/</u>	20	24	50	24	20	24	TM 1-H34-S
4/CH-47A, 5/B/C	200	80 ¹	<u>3/</u>	60 <u>3/</u>	48	24	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	70	24	40	24	TM 1-CH47-S
4/CH-54A	200	80 <u>1/</u>	<u>3/</u>	<u>3/</u>	72	24	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	90	48	60	24	TM 1-CH54-S
OH-6A	<u>3/</u>	<u>3/</u>	90 <u>3/</u>	35	<u>3/</u>	<u>1/3/</u>	48 <u>3/</u>	24	40 <u>3/</u>	24 <u>3/</u>	6	12	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	TM 1-OH-6-S
OH-13, H, S, TH-13T	<u>3/</u>	<u>3/</u>	90 <u>3/</u>	35 <u>3/</u>	<u>3/</u>	<u>3/</u>	48 <u>3/</u>	24	40 <u>3/</u>	48 <u>3/</u>	6	12	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	TM 1-OH13-S
OH-23, D, F, G	<u>3/</u>	<u>3/</u>	90 <u>3/</u>	35 <u>3/</u>	<u>3/</u>	<u>3/</u>	48 <u>3/</u>	24	40 <u>3/</u>	48 <u>3/</u>	6	12	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	TM 1-OH23-S
4/OH-58A	<u>3/</u>	<u>3/</u>	90 <u>3/</u>	32	<u>3/</u>	<u>1/3/</u>	40 <u>3/</u>	24	40 <u>3/</u>	24 <u>3/</u>	8	12	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	TM 1-OH58-S
4/UH-1, B, C, D, H, M	100	60 <u>1/</u>	<u>3/</u>	55	30	24	<u>3/</u>	24	<u>3/</u>	<u>3/</u>	12	12	30	12	16	12	TM 1-UH-1-S

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2-32. Surface Shipment Processing Time (CONT).

TYPE OF AIR-CRAFT	DIRECT LABOR (MAN-HOURS REQUIRED TO PROCESS FOR OVERSEAS SHIPMENT) <u>2/</u>				ELAPSED TIME TO PROCESS (HOURS)				MAN-HOURS (M/H) AND ELAPSED TIME (ET) TO DEPROCESS								REFERENCED PUBLICATIONS
	TOP DECK LOADING		BELOW DECK LOADING		TOP DECK LOADING		BELOW DECK LOADING		BELOW DECK CRATED		BELOW DECK UN-CRATED		TOP DECK STRIP-PABLE COAT-ING		TOP DECK REUS-ABLE COVERS		
	STRIP COAT-ING	REUS-ABLE COVERS	CRATED	UN-CRATED	STRIP COAT-ING	REUS-ABLE COVER	CRATED	UN-CRATED	M/H	ET	M/H	ET	M/H	ET	M/H	ET	
O-1, D,E, F,G	<u>3/</u>	<u>3/</u>	95	20	<u>3/</u>	<u>3/</u>	48	24	50	48	16	8	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	TM 1-01-S
U-1A	125	<u>3/</u>	<u>3/</u>	50	48	<u>3/</u>	<u>3/</u>	24	<u>3/</u>	<u>3/</u>	50	24	50	24	<u>3/</u>	<u>3/</u>	TM 1-U1-S
U-6A	125	<u>3/</u>	<u>3/</u>	40	48	<u>3/</u>	<u>3/</u>	24	<u>3/</u>	<u>3/</u>	40	24	50	24	<u>3/</u>	<u>3/</u>	TM 1-L20-S
U-8D, F,G, RU-8D	140	90 <u>1/</u>	<u>3/</u>	60	48	24	<u>3/</u>	24	<u>3/</u>	<u>3/</u>	50	24	70	24	40	24	TM 1-U8-S
U-10A	125	60 <u>1/</u>	120	40	72	24	70	48	40	24	50	24	70	48	30	24	NVAL
<u>4/</u> U-21 RU-21	140	90 <u>1/</u>	<u>3/</u>	60	48	24	<u>3/</u>	24	<u>3/</u>	<u>3/</u>	50	24	70	24	40	24	TM 1-U21-S
<u>4/</u> OV-1A, B,C	140	90 <u>1/</u>	<u>3/</u>	<u>3/</u>	48	24	<u>3/</u>	24	<u>3/</u>	<u>3/</u>	<u>3/</u>	31	70	24	40	24	TM 1-OV1-S
T-42A	150	80 <u>1/</u>	<u>3/</u>	60	120	24	<u>3/</u>	24	<u>3/</u>	<u>3/</u>	30	24	70	48	40	24	NVAL

^{1/}Cover sets are not items of supply to be requisitioned. Only CONUS and overseas outloading points preparing aircraft for movement are authorized to request cover sets.

^{2/}M/H and ET do not include time to manufacture shipping crates.

^{3/}Not recommended

^{4/}If aircraft are scheduled for fly-off shipment, contact MSC (Military Sealift Command) for fuel restriction.

^{5/}If CH-47's are scheduled for fly-off delivery from MSC carriers, contact MSC for information on PSI/sq. ft. load factor of elevator and hanger deck.

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2-33. Air Shipment and Ferrying.

AIRCRAFT TYPE	AIR SHIPMENT										FERRYING		
	AIR FORCE AIRCRAFT	REQUIRED DISASSEMBLY	REQUIRE- MENTS FOR DISASSEMBLY			REQUIRE- MENTS FOR REASSEMBLY			REFERENCED PUBLICATIONS	NO. OF ACFT CAN BE LOADED ^{8/}	AIRCRAFT MODEL	WITHOUT FERRY TANKS (N/M)	WITH FERRY TANKS (N/M)
			CREW	M/H	ET	CREW	M/H	ET					
AH-1G	C-133	Main rotor blades, mast assembly, tail rotor blades, Synch eleva- tor, wings, Antennas	5	8	2	5	9	2.5	TM 1-AH1-S	4 ^{9/}			
	C-124	(Same)	5	8	2	5	9	2.5	TM 1-AH1-S	2			
	C-141	Same plus fairings (Clean to fuselage)	5	12	4	5	14	5	TM 1-AH1-S	2			
CH-34	C-133 C-124	Rotor blades, tail pylon, landing gear, hub and trans- mission assy	6	27	5	6	30	5	TM 1-H34-S	2		385	NA

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2-33. Air Shipment and Ferrying (CONT).

AIRCRAFT TYPE	AIR SHIPMENT										FERRYING		
	AIR FORCE AIRCRAFT	REQUIRED DISASSEMBLY	REQUIRE- MENTS FOR DISASSEMBLY			REQUIRE- MENTS FOR REASSEMBLY			REFERENCED PUBLICATIONS	NO. OF ACFT CAN BE LOADED <u>8/</u>	AIRCRAFT MODEL	WITHOUT FERRY TANKS (N/M)	WITH FERRY TANKS (N/M)
			CREW	M/H	ET	CREW	M/H	ET					
CH-47A,B, C	C-133B	Rotor blades, hubs, trans- missions, pylons, pods, en- gines	15	160	24	15	290	48	TM 1-CH-47-S	1		200	826
CH-54A/B	C-133	Landing gear <u>11/</u> , Rotor blades	12	160	14	14	220	36	TM 1-CH-54-S	1		320	NA
OH-6A	C-141 C-133 C-130 C-124	Rotor blades, horizontal stabilizers (as neces- sary)	3 3 3 3	3 3 3 3	2 2 3 2	3 3 3 3	4 4 4 4	2 2 2 2	TM 1-OH-6-S	6 8 3 6		300	1000
OH-13 H,S,TH- 13T	C-141 C-133 C-130 C-124	<u>1/</u> <u>5/</u> <u>5/ 6/</u> <u>1/</u>	4 4 4 4	3 3 4 3	2 2 2 2	4 4 4 4	2 2 4 2	1 1 2 1	TM 1-OH-13-S	3 5 2 4	E G H,S	150 214 165	NA NA NA
OH-23, D,F,G	C-133 C-124 C-141	<u>5/</u> <u>5/</u> Rotor blades, transmis- sions, mast and hub	4 4 4	3 3 8	2 2 4	4 4 4	2 2 10	1 1 4	TM 1-OH-23-S	5 2 2	B,C D F,G	99 177 195	NA NA NA
OH-58A	C-124 C-130 C-133 C-141	<u>12/ 8/</u> <u>7/ 8/</u> <u>12/ 8/</u> <u>2/ 8/</u>	3 3 3 3	6 6 6 6	2 2 2 2	3 3 3 3	7 7 7 7	2 2 2 2	TM 1-OH58-S	4 2 6 4		350	NA

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2-33. Air Shipment and Ferrying (CONT).

AIRCRAFT TYPE	AIR SHIPMENT										FERRYING		
	AIR FORCE AIRCRAFT	REQUIRED DISASSEMBLY	REQUIRE- MENTS FOR DISASSEMBLY			REQUIRE- MENTS FOR REASSEMBLY			REFERENCED PUBLICATIONS	NO. OF ACFT CAN BE LOADED ⁸	AIRCRAFT MODEL	WITHOUT FERRY TANKS (N/M)	WITH FERRY TANKS (N/M)
			CREW	M/H	ET	CREW	M/H	ET					
UH-1B,C, D,H,M	C-133	<u>7/</u>							TM 55-450-3 TM 1-UH1-1	4	B C,M D,H	234	609
	C-130		6	10	3	6	12	3		1		314	630
	C-124									2		218	643
	C-141	<u>7/</u> 10/Rotor blades, trans- mission, mast and hub	6	14	5	6	16	5		2			
O-1D,E, F,G	C-141	<u>1/</u>							T.O. 1C-141A-9 TM 55-450-2 TM 1-L19-S	3	A D,F E,G	488	880
	C-133	<u>1/</u>	6	15	3	8	16	2		5		547	956
	C-130									2		460	800
	C-124									4			
U-1A	C-133	<u>1/</u>	6	32	4	6	34	6	TM 1-U1-S	1		825	927
	C-124	<u>2/</u>	6	34	4	6	36	6		1			
	C-141	<u>2/</u>	6	34	4	6	36	6		1			
U-6A	C-141	<u>1/</u>							T.O. 1C-141A-9	2		644	750
	C-133	<u>1/</u>	7	12	2	8	16	2		3			
	C-130	<u>1/</u> plus <u>3/</u>	7	18	3	8	16	2	1				
	C-124	<u>1/</u> plus <u>3/</u>	7	18	3	8	16	2	2				
U-8,RU-8	<u>4/</u>	Not applicable									D,G,RU-8 F	1136 1214	NVAL 1600
U-10		Not available this printing										NVAL	NVAL
U-21	<u>4/</u>	Not applicable									A,B,C	300	1600
OV-1	<u>4/</u>	Not applicable										750	NVAL
T-42	<u>4/</u>	Not applicable											

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2-33. Air Shipment and Ferrying (CONT).

Source: AMSAV-R-M

- 1/ Wings, tail assembly, antenna
- 2/ Landing gear in addition to ¹
- 3/ Reduce width of landing gear
- 4/ Not practical because of disassembly requirements
- 5/ One main rotor blade and antenna
- 6/ Disassemble one aircraft per ⁵ and one aircraft per ⁷ to load two aircraft in transport
- 7/ Both main rotor blades, one tail rotor blade, stabilizer bar with mast assembly, antenna, and synchronized elevators, as applicable
- 8/ Numbers can be increased by further disassembly
- 9/ Mast remains installed on last two AH-1G's loaded
- 10/ Landing gear is replaced by a special transportability skid
- 11/ Separate cockpit from fuselage at station 210
- 12/ Both main rotor blades, horizontal stabilizers

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2-34. Weight and Cube for Crated Shipment.

TYPE OF AIRCRAFT	WEIGHT (LB)	CUBE (CU FT)
AH-1G	NVAL	NVAL
CH-34C	22,000	4,670
CH-47A	*	*
CH-47B	*	*
CH-47C	*	*
CH-54A	*	*
CH-54B	*	*
OH-6A	*	*
OH-13H	4,800	930
OH-13S	5,100	990
OH-23D	4,300	740
OH-23F	4,450	770
OH-23G	4,400	740
OH-58A	5,000	1,280
UH-1B	10,610	2,241
UH-1C	10,610	2,241
UH-1D	12,500	2,400
UH-1H	12,500	2,400
UH-1M	10,610	2,241
TH-13T	4,800	930
TH-55A	*	*
O-1D	3,800	1,430
O-1E	3,800	1,430
O-1G	3,800	1,430
U-1A	15,170	4,070
U-6A	6,900	2,890
U-8D	*	*
U-8F	*	*
U-8G	*	*
U-10A	NVAL	NVAL
U-21A	*	*
OV-1A	*	*
OV-1B	*	*
OV-1C	*	*
OV-1D	*	*
T-41B	*	*
T-42A	*	*

(*) Crating of aircraft not recommended

SOURCE: AMSAV-R-M

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Section IV. TOOLS*

2-35. Aircraft Shop Sets/Tool Kits/Tool Sets (Common).

2-36. Shop Sets.

NOMENCLATURE	SM/SC
Shop set, aircraft maintenance, ground handling and servicing, Set A, direct support (Army) (FSN 1730-999-6194)	SC 1730-99-CL-A01
Shop set, aircraft maintenance, ground handling and servicing, Set B, direct support (Army) (FSN 1730-999-6195)	SC 1730-99-CL-A02
Shop set, aircraft maintenance, ground handling and servicing, Set C, general support (Army) (FSN 1730-999-6193)	SC 1730-99-CL-A03
Shop set, aircraft ground handling and servicing, airmobile, direct support maintenance, Battalion GHS (FSN 1730-900-8316)	SC 1730-99-CL-A04
Shop set, aircraft maintenance, fixed base, flaw detection, Set A, direct support (FSN 4920-321-9353)	SC 4920-99-CL-A01
Shop set, aircraft maintenance, fixed base, sheet metal, Set A, direct support (Army) (FSN 4920-944-1005)	SC 4920-99-CL-A02
Shop set, aircraft maintenance, fixed base, sheet metal, Set B, direct support (Army) (FSN 4920-944-1006)	SC 4920-99-CL-A03
Shop set, aircraft, maintenance, fixed base, sheet metal, Set C, general support (Army) (FSN 4920-944-0996)	SC 4920-99-CL-A04
Shop set, aircraft maintenance, fixed base, hydraulic, Set A, direct support (FSN 4920-321-9363)	SC 4920-99-CL-A05
Shop set, aircraft maintenance, fixed base, hydraulic, Set B, direct support (FSN 4920-321-9364)	SC 4920-99-CL-A06

*Source: AMSAV-R-M

2-36. Shop Sets (CONT).

NOMENCLATURE	SM/SC
Shop set, aircraft maintenance, fixed base, hydraulic, Set C, general support (FSN 4920-321-9373)	SC 4920-99-CL-A07
Shop set, aircraft maintenance, fixed base, welding, Set A, direct support (FSN 4920-321-9375)	SC 4920-99-CL-A08
Shop set, aircraft maintenance, fixed base, welding, Set B, direct support (FSN 4920-321-9376)	SC 4920-99-CL-A09
Shop set, aircraft maintenance, fixed base, welding, Set C, general support (Army) (FSN 4920-944-0785)	SC 4920-99-CL-A10
Shop set, aircraft maintenance, fixed base, tool crib, Set A, direct support (FSN 4920-321-9397)	SC 4920-99-CL-A11
Shop set, aircraft maintenance, fixed base, tool crib, Set B, direct support (FSN 4920-321-9403)	SC 4920-99-CL-A12
Shop set, aircraft maintenance, fixed base, tool crib, Set C, general support (FSN 4920-321-9405)	SC 4920-99-CL-A13
Shop set, aircraft maintenance, fixed base, electrical, Set A, direct support (Army) (FSN 4920-944-0761)	SC 4920-99-CL-A14
Shop set aircraft maintenance, fixed base, electrical, Set B, direct support (Army) (FSN 4920-944-0760)	SC 4920-99-CL-A15
Shop set, aircraft maintenance, fixed base, electrical, Set C, general support (Army) (FSN 4920-944-0757)	SC 4920-99-CL-A16
Shop set, aircraft maintenance, fixed base, flaw detection, Set B, direct support (FSN 4920-321-9410)	SC 4920-99-CL-A17
Shop set, aircraft maintenance, fixed base, flaw detection, Set C, general support (FSN 4920-321-9411)	SC 4920-99-CL-A18
Shop set, aircraft maintenance, fixed base, paint, Set B, direct support (Army) (FSN 4920-944-0759)	SC 4920-99-CL-A19
Shop set, aircraft maintenance, fixed base, paint, Set C, general support (Army) (FSN 4920-944-1007)	SC 4920-99-CL-A20
Shop set, aircraft maintenance, fixed base, instrument, Set B, direct support (FSN 4920-321-9416)	SC 4920-99-CL-A21

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2-36. Shop Sets (CONT).

NOMENCLATURE	SM/SC
Shop set, aircraft maintenance, fixed base, instrument, Set C, general support (Army) (FSN 4920-944-0784)	SC 4920-99-CL-A22
Shop set, aircraft maintenance, fixed base, engine, Set B, direct support (Army) (FSN 4920-944-0884)	SC 4920-99-CL-A23
Shop set, aircraft maintenance, fixed base, engine, Set C, general support (Army) (FSN 4920-944-0786)	SC 4920-99-CL-A24
Shop set, aircraft maintenance, fixed base, propeller and rotor, Set B, direct support (Army) (FSN 4920-944-1014)	SC 4920-99-CL-A25
Shop set, aircraft maintenance, fixed base, propeller and rotor, Set C, general support (Army) (FSN 4920-944-1015)	SC 4920-99-CL-A26
Shop set, aircraft maintenance, fixed base, power train, general support (Army) (FSN 4920-944-0838)	SC 4920-99-CL-A27
Shop set, aircraft maintenance, semitrailer mounted, A-1, tool crib, electrical, flaw detection, direct support (FSN 4920-621-2032)	SC 4920-99-CL-A28
Shop set, aircraft maintenance, semitrailer mounted, A-2, sheet metal, welding, hydraulic, direct support (FSN 4920-621-2033)	SC 4920-99-CL-A29
Shop set, aircraft maintenance, semitrailer mounted, B-1, tool crib, flaw detection, direct support (FSN 4920-621-2034)	SC 4920-99-CL-A30
Shop set, aircraft maintenance, semitrailer and trailer mounted, B-2, electrical, instrument, and hydraulic, direct support (FSN 4920-621-2035)	SC 4920-99-CL-A31
Shop set, aircraft maintenance, semitrailer mounted, B-3, sheet metal and welding, direct support (FSN 4920-621-2036)	SC 4920-99-CL-A32
Shop set, aircraft maintenance, semitrailer mounted, B-4, machine and engine shop, direct support (FSN 4920-621-2037)	SC 4920-99-CL-A33

2-36. Shop Sets (CONT).

NOMENCLATURE	SM/SC
Shop set, aircraft maintenance, trailer mounted, B-6, paint shop, direct support (FSN 4920-621-2038)	SC 4920-99-CL-A34
Shop set, aircraft maintenance, semitrailer mounted, C-1, tool crib, general support (FSN 4920-621-2039)	SC 4920-99-CL-A35
Shop set, aircraft maintenance, semitrailer and trailer mounted, C-2, electrical shop, general support (FSN 4920-621-2040)	SC 4920-99-CL-A36
Shop set, aircraft maintenance, semitrailer mounted, C-3, flaw detection, general support (FSN 4920-621-2041)	SC 4920-99-CL-A37
Shop set, aircraft maintenance, semitrailer mounted, C-4, sheet metal, general support (FSN 4920-621-2042)	SC 4920-99-CL-A38
Shop set, aircraft maintenance, semitrailer mounted, C-5, welding, general support (FSN 4920-621-2043)	SC 4920-99-CL-A39
Shop set, aircraft maintenance, semitrailer mounted, C-6, machine shop, general support (FSN 4920-621-2044)	SC 4920-99-CL-A40
Shop set, aircraft maintenance, semitrailer mounted, C-7, engine and hydraulic, general support (FSN 4920-621-2045)	SC 4920-99-CL-A41
Shop set, aircraft maintenance, semitrailer mounted, C-8, instrument shop, general support (FSN 4920-621-2046)	SC 4920-99-CL-A42
Shop set, aircraft maintenance, trailer mounted, C-10, paint shop, general support (FSN 4920-621-2047)	SC 4920-99-CL-A43
Shop set, aircraft maintenance, semitrailer mounted, B-5, propeller and rotor, direct support (FSN 4920-649-7098)	SC 4920-99-CL-A44
Shop set, aircraft maintenance, semitrailer mounted, C-9, propeller and rotor, general support (FSN 4920-649-6509)	SC 4920-99-CL-A45
Shop set, aircraft maintenance, semitrailer mounted, C-11, power train, general support (FSN 4920-649-6510)	SC 4920-99-CL-A46

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2-36. Shop Sets (CONT).

NOMENCLATURE	SM/SC
Shop set, aircraft maintenance, airmobile, direct support section, airmobile division (FSN 4920-906-9727)	SC 4920-99-CL-A47
Shop set, aircraft maintenance, airmobile, tool crib, direct support maintenance, Battalion set No. 1 (FSN 4920-906-9728)	SC 4920-99-CL-A48
Shop set, aircraft maintenance, airmobile, electrical, instrument hydraulic, direct support maintenance, Battalion set No. 2 (FSN 4920-906-9729)	SC 4920-99-CL-A49
Shop set, aircraft maintenance, airmobile, sheet metal and welding, direct support, Battalion set No. 3 (FSN 4920-906-9730)	SC 4920-99-CL-A50
Shop set, aircraft maintenance, airmobile, machine and engine, direct support maintenance, Battalion set No. 4 (FSN 4920-906-9731)	SC 4920-99-CL-A51
Shop set, aircraft maintenance, airmobile, propeller and rotor, direct support maintenance, Battalion set No. 5 (FSN 4920-906-9732)	SC 4920-99-CL-A52
Shop set, aircraft maintenance, airmobile, flaw detection, direct support maintenance, Battalion set No. 6 (FSN 4920-906-9733)	SC 4920-99-CL-A53
Shop set, aircraft maintenance, airmobile, company size, direct support, CH-47 (FSN 4920-133-8157)	SC 4920-99-CL-A89
Shop set aircraft maintenance, airmobile, company size, direct support, CH-47/OH-6 (FSN 4920-133-8156)	SC 4920-99-CL-A89
Shop set, aircraft maintenance, airmobile, company size, direct support, UH-1 (FSN 4920-133-8154)	SC 4920-99-CL-A89
Shop set, aircraft maintenance, airmobile, company size, direct support, UH-1/OH-6 (FSN 4920-133-8158)	SC 4920-99-CL-A89
Shop set, aircraft maintenance, airmobile, company size, direct support, UH-1/OH-6/OV-1 (FSN 4920-133-8155)	SC 4920-99-CL-A89

2-37. Tool Kits

NOMENCLATURE	SM/SC
Tool kit, aircraft mechanic's general (FSN 5180-323-4692)	SC 5180-99-CL-A01
Tool kit, airframe repairman's, Army aircraft (FSN 5180-323-4876)	SC 5180-99-CL-A02
Tool kit, hydraulic repairman's, Army aircraft (FSN 5180-323-4891)	SC 5180-99-CL-A03
Tool kit, propeller and rotor repairman's, Army aircraft (FSN 5180-323-4909)	SC 5180-99-CL-A04
Tool kit, instrument repairman's, Army aircraft (FSN 5180-323-4913)	SC 5180-99-CL-A05
Tool kit, electrical repairman's, Army aircraft (FSN 5180-323-4915)	SC 5108-99-CL-A06
Tool kit, engine and power train repairman's, Army aircraft (FSN 5180-323-4944)	SC 5180-99-CL-A07
Tool kit, aircraft inspection, technical (FSN 5180-323-5114)	SC 5180-99-CL-A09
Tool kit, trainer, flight simulator, set No. 1 (FSN 5180-859-0556)	SC 5180-99-CL-A10
Tool kit, Army aircraft, crash investigation (FSN 5180-903-1049)	SC 5180-99-CL-A11

2-38. Tool Sets.

NOMENCLATURE	SM/SC
Tool set, aircraft maintenance, airmobile, UH-1, Organizational maintenance, airmobile division (FSN 4920-906-9739)	SC 4920-99-CL-A64
Tool set, aircraft maintenance, airmobile, CH-47, Organizational maintenance, airmobile division (FSN 4920-906-9740)	SC 4920-99-CL-A65
Tool set, aircraft maintenance, airmobile, OH-13, Organizational maintenance. (FSN 4920-906-9743)	SC 4920-99-CL-A68
Tool set, organizational maintenance, Army aircraft, Set A, (Army) (FSN 4920-944-0990),	SC 4920-99-CL-A71

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2-38. Tool Sets (CONT).

NOMENCLATURE	SM/SC
Set A supplement (Army) (FSN 4920-944-0985),	SC 4920-99-CL-A71
Set B (Army) (FSN 4920-944-1003),	SC 4920-99-CL-A71
Set C (Army) (FSN 4920-944-1004)	SC 4920-99-CL-A71
Tool set, aircraft maintenance, airmobile, OH-6, Organizational maintenance (FSN 4920-947-3471)	SC 4920-99-CL-A77

2-39. Aircraft Special Tools.

AIRCRAFT	NOMENCLATURE	TM
AH-1G,	Direct Support, General Support and Depot Maintenance	TM 55-1520-221-35P
TH-1G	Repair Parts and Special Tools List: Helicopter, Attack AH-1G (BELL) FSN's 1520-999-9821 (AH-1G), 1520-804- 3635 (TH-1G)	
CH-34C	Direct Support, General Support, and Depot Maintenance	TM 55-1520-202-35P
	Repair Parts and Special Tools Lists: Helicopter Cargo Transport CH-34 (SIKORSKY), FSN 1520-633-6831 (CH-34C)	
CH-47A,B,C	Direct Support, General Support, and Depot Maintenance	TM 55-1520-209-34P
	Repair Parts and Special Tools List: Helicopter, Cargo Transport, CH-47 (VERTOL) FSN's 1520-633-6836 (CH-47A), 1520-990-2941 (CH-47B), 1520-871-7308 (CH-47C)	
CH-54A,B . .	Direct Support, General Support and Depot Maintenance	TM 55-1520-217-34P
	Repair Parts and Special Tools List: Helicopter, Cargo Transport CH-54 (SIKORSKY) FSN's 1520-964-9601 (CH-54A), 1520-113-5776 (CH-54B)	
OH-6A	Direct Support, General Support and Depot Maintenance	TM 55-1520-214-35P
	Repair Parts and Special Tools List: Helicopter, Observation OH-6A (HUGHES) FSN 1520-918-1523 (OH-6A)	
OH-13H,S, TH-13T	Direct Support, General Support, and Depot Maintenance	TM 55-1520-204-35P
	Repair Parts and Special Tools Lists: Helicopter, Ob- servation OH-13 (BELL), 1520-574-7952 (OH-13H), 1520-973-1227 (OH-13S), 1520-760-3333 (TH-13T),	

2-39. Aircraft Special Tools (CONT).

AIRCRAFT	NOMENCLATURE	TM
OH-23D, . . . F,G	Direct Support, General Support and Depot Maintenance Repair Parts and Special Tools List: Helicopter, Observation, OH-23 (HILLER), FSN's 1520-591-0564 (OH-23D), 1520-893-2726 (OH-23F), 1520-973-1226 (OH-23G)	TM 55-1520-206-35P
OH-58A . . .	Direct Support, and General Support Maintenance Repair and Special Tools List: Helicopter, Observation, OH-58A (Bell), FSN 1520-169-7137	TM 55-1520-228-34P
UH-1 B,C,D,H	Direct Support and General Support, Maintenance Repair Parts and Special Tools List: Helicopter, Utility- Tactical Transport, UH-1B, UH-1C, UH-1D, UH-1H (BELL), FSN's 1520-713-9912 (UH-1B), 1520-997-8862 (UH-1C), 1520-859-2670 (UH-1D), 1520-087-7637 (UH-1H)	TM 55-1520-210-34P
TH-55A . . .		Commercial Manuals Only
O-1D E,F,G, TO-1E	Direct Support and General Support, Maintenance Repair Parts and Special Tools List: Airplane, Observation O-1 and Airplane, Flight Trainer, TO-1 (CESSNA), FSN's 1510-903-0236 (O-1D), 1510-591-0565 (O-1E), 1510-967-7653 (O-1F), 1510-924-8466 (O-1G), 1510-670-9455 (TO-1A), 1510-670-9456 (TO-E)	TM 55-1510-202-34P
U-1A	Direct Support and General Support, Maintenance Repair Parts and Special Tools List: Airplane, Utility, U-1A (DE HAVILLAND), FSN's 1510-508-1494 (U-1A)	TM 55-1510-205-34P
U-6A, RU-6A	Direct Support, and General Support, Maintenance Repair Parts and Special Tools List: Airplane, Utility U-6A, RU-6A (DE HAVILLAND), FSN's 1510-508-0604 (U-6A), 1510-950-6962 (RU-6A)	TM 55-1510-203-34P
U-8D,F,G, RU-8D	Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools List: Airplane, Utility, U-8, (BEECH) Airplane, Utility, Reconnaissance, RU-8D (BEECH) FSN's 1510-574-7938 (U-8D), 1510-701-2233 (U-8F), FSN 1510-912-4084 (U-8G), 1510-945-9998 (RU-8D)	TM 55-1510-201-35P

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2-39. Aircraft Special Tools (CONT).

AIRCRAFT	NOMENCLATURE	TM
U-10A		AF T.O. 1U-10A-1 AF T.O. 1U-10A-2 AF T.O. 1U-10A-4 TM 55-1510-209-34P
U-21A,	Direct Support, General Support, and Depot Maintenance Repair	
RU-21A,B,C,	Parts and Special Tools List: Airplane, Utility U-21A (BEECH)	
D	FSN's 1510-933-8223 (U-21A), Airplane, Reconnaissance, Utility, RU-21 (BEECH) 1510-587-3375 (RU-21A), 1510-878- 4338 (RU-21B), 1510-878-4336 (RU-21C), 1510-804-3641 (RU-21D)	
OV-1A,B, . .	Direct Support, General Support, and Depot Maintenance	TM 55-1510-204-35P
C,D	Repair Parts and Special Tools List: Airplane, Observation STOL, OV-1 (GRUMMAN), FSN's 1510-715-9378 (OV-1A), 1510-715-9379 (OV-1B), 1510-715-9380 (OV-1C), 1510-869-3654 (OV-1D)	
T-41B		Commercial Manual Only
T-42		Commercial Manual Only
Aircraft/ . . .	Organizational, Direct Support, General Support, and	2B12 NVAL this
Instrument	Depot Maintenance Repair Parts and Special Tools List,	Printing
Trainers	Trainer, Flight Simulator 2-B-3 (Trainer Corp of	2B3 55-6930
2-B-3,	America) 2-B-3A (Transdyne Corp) FSN 6930-602-5271	201-25P
2-B-3A	(2-B-3) 6930-751-8671 (2-B-3A)	TM 55-6930-201-25P
9E2A	Organizational, Direct Support, General Support, and	TM 55-6930-205-15
	Depot Maintenance Manual, Ejection Seat Training Device (9E2A), FSN 6930-758-9791	

2-40. Aircraft Engine Special Tools.

ENGINE	APPLICABLE AIRCRAFT	NOMENCLATURE	TM
O-435-23B O-435-23C O-435-25 O-435-25A	OH-13H OH-13H,OH-23D OH-13H,TH-13T OH-13H,TH-13T	Direct Support, General Support and Depot Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Reciprocating (LYCOMING) FSN's 2810-605-5925 (O-435-23B), 2810-919-0188 (O-435-23C), 2810-994-8877 (O-435-25), 2810-949-8268 (O-435-25A)	TM 55-2810-221-35P
O-470-11 O-470-11A O-470-11B O-470-15	O-1E,G, TO-1E O-1E,G TO-1,E O-1E,G TO-1E O-1D,F	Direct Support and General Support Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Reciprocating (CONTINENTAL), FSN's 2810-600-4657 (O-470-11), 2810-064-6520 (O-470-11A), 2810-857-3272 (O-470-11B), 2810-600-4663 (O-470-15)	TM 55-2810-219-34P
O-480-1 O-480-1A O-480-1B O-480-3 O-480-3A	U-8D,G RU-8D U-8D,G RU-8D U-8D,G RU-8D U-8F U-8F	Direct Support, General Support and Depot Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Reciprocating (LYCOMING) FSN's 2810-600-4666 (O-480-1), 2810-764-5961 (O-480-1A), 2810-109-4578 (O-480-1B), 2810-893-3013 (O-480-3), 2810-109-4577 (O-480-3A)	TM 55-2810-218-35P
O-540-9 O-540-9A	OH-23F,G OH-23F,G	Direct Support, General Support and Depot Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Reciprocating (LYCOMING) FSN's 2810-980-3375 (O-540-9), 2810-893-5568 (O-540-9A)	TM 55-2810-222-35P
R-985-AN-39 R-985-AN-39A	U-6A U-6A, RU-6A	Direct Support and General Support Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Reciprocating (PRATT and WHITNEY) FSN's 2810-624-0647 (R-985-AN-39), 2810-624-0648 (R-985-AN-39A)	TM 55-2810-224-34P

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2-40. Aircraft Engine Special Tools (CONT).

ENGINE	APPLICABLE AIRCRAFT	NOMENCLATURE	TM
R-1340-59 R-1340-61	U-1A U-1A, RU-1A	Direct Support and General Support Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Reciprocating (PRATT-WHITNEY) FSN's 2810-600-4648 (R-1340-59), 2810-678-0392 (R-1340-61)	TM 55-2810-223-34P
T-53-L-5 T-53-L-9A T-53-L-11 T-53-L-11SA T-53-L-11B T-53-L-11C T-53-L-11D T-53-L-13 T-53-L-13A T-53-L-13B	UH-1B UH-1B,D UH-1B D UH-1B,D UH-1B,D UH-1B,D UH-1B,D UH-1H,AH-1G UH-1H,AH-1G UH-1H,AH-1G	Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Turbine (LYCOMING) FSN's 2840-713-9913 (T-53-L-5), 2840-086-8438 (T-53-L-9A), 2840-858-5562 (T-53-L-11), 2840-875-9939 (T-53-L-11SA), 2840-999-6228 (T-53-L-11B), 2840-102-3967 (T-53-L-11C), 2840-102-3968 (T-53-L-11D), 2840-911-7685 (T-53-L-13), 2840-102-3969 (T-53-L-13A), 2840-134-4803 (T-53-L-13B)	TM 55-2840-229-34P
T-53-L-7 T-53-L-7A T-53-L-15 T-53-L-701	OV-1B OV-1B OV-1C OV-1D	Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Reciprocating (LYCOMING) FSN's 2840-894-6509 (T-53-L-7), 2840-102-3966 (T-53-L-7A), 2840-957-2853 (T-53-L-15), 2840-116-7134 (T-53-L-701)	TM 55-2840-233-35P
T-55-L-7 T-55-L-7B T-55-L-7C T-55-L-11	CH-47A CH-47A CH-47B,C CH-47C	Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Turboprop (LYCOMING) FSN's 2840-987-9717 (T-55-L-7), 2840-950-6875 (T-55-L-7B), 2840-937-0480 (T-55-L-7C), 2840-063-080 (T-55-L-11)	TM 55-2840-234-34P
T-62-T-2A T-62-T-2A1 T-62-T-16A1 T-62-T-16A2	CH-47A CH-47A,B,C CH-54A,B CH-54A,B	Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools List: Auxiliary Power Unit, Turbine Engine (SOLAR) FSN's 2835-906-6766 (T-62-T-2A), 2835-809-8316 (T-62-T-2A1), 2835-931-4775 (T-62-T-16A1)	TM 55-2835-203-34P

2-40. Aircraft Engine Special Tools (CONT).

ENGINE	APPLICABLE AIRCRAFT	NOMENCLATURE	TM
T-63-A-5A T-63-A-700	OH-6 OH-58	Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Gas Turbine (ALLISON) FSN's 2840-923-6023 (T-63-A-5A), 2840-179-5536 (T-63-A-700)	TM 55-2840-231-35P
JFTD12A-1 T-73-P-1 T-73-P-700	CH-54A CH-54A CH-54B	Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Free Turbine (PRATT and WHITNEY) FSN's 2840-919-7975 (JFTD12A-1), 2840-904-2461 (T73-P-1), 2840-123-0682 (T73-P-700)	TM 55-2840-232-34P
PT6A-20 T74-CP-700 T74-CP-702	U-21A RU-21A,D,E RU-21B,C	Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tools List: Engine, Aircraft, Turboprop (PRATT and WHITNEY) FSN's 2840-933-8343 (PT6A-20), 2840-855-6100 (T74-CP-700), 2840-707-3571 (T74-CP-702)	TM 55-2840-230-34P

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Section V. INSPECTIONS

2-41. Aircraft Inspections.

TYPE OF AIRCRAFT	TM	TYPE OF AIRCRAFT	TM
AH-1G	TM 55-1520-221-PMD TM 55-1520-221-PMI TM 55-1520-221-PMP	CH-54B	TM 55-1520-217-20PMD/2 TM 55-1520-217-20PMI/2 TM 55-1520-217-20PMP/2
Inspection	Man-hours <u>1</u> /	Inspection	Man-hours <u>1</u> /
Daily	Not Available	Daily	7.00
Intermediate	Not Available	Intermediate	32.00
Periodic	Not Available	Periodic	60.00
CH-34C	TM 55-1520-202-20PMD TM 55-1520-202-20PMI TM 55-1520-202-20PMP	OH-6A	TM 55-1520-214-20PMD TM 55-1520-214-20PMP
Inspection	Man-hours <u>1</u> /	Inspection	Man-hours <u>1</u> /
Daily	0.98	Daily	0.80
Intermediate	3.01	Periodic	27.00
Periodic	132.93	OH-13H	TM 55-1520-224-20PMD TM 55-1520-224-20PMI TM 55-1520-224-20PMP
CH-47A <u>2</u> /	TM 55-1520-209-20PMD TM 55-1520-209-20PMI TM 55-1520-209-20PMP	Inspection	Man-hours <u>1</u> /
Inspection	Man-hours <u>1</u> /	Daily	0.34
Daily	7.4	Intermediate	2.66
Intermediate	88.7	Periodic	31.36
Periodic	231.3	OH-13S	TM 55-1520-225-PMD TM 55-1520-225-20PMI TM 55-1520-225-PMP
CH-47B,C	TM 55-1520-227-20PMD TM 55-1520-227-20PMI TM 55-1520-227-20PMP	Inspection	Man-hours <u>1</u> /
Inspection	Man-hours <u>1</u> /	Daily	0.34
Daily	6.9	Intermediate	2.66
Intermediate	61.4	Periodic	31.36
Periodic	204.9	TH-13T	TM 55-1520-226-PMD TM 55-1520-226-PMI TM 55-1520-226-PMP
CH-54A	TM 55-1520-217-20PMD/1 TM 55-1520-217-20PMI/1 TM 55-1520-217-20PMP/1	Inspection	Man-hours <u>1</u> /
Inspection	Man-hours <u>1</u> /	Daily	0.34
Daily	7.00	Intermediate	2.66
Intermediate	32.00	Periodic	31.36
Periodic	60.00	OH-23	TM 55-1520-206-20PMD TM 55-1520-206-20PMI TM 55-1520-206-20PMP
		Inspection	Man-hours <u>1</u> /
		Daily	0.36
		Intermediate	1.60
		Periodic	38.43

2-41. Aircraft Inspections (CONT).

AIRCRAFT	TM	AIRCRAFT	TM
OH-58A	TM 55-1520-228PMD TM 55-1520-228-PMP	OV-1D	TM 55-1510-204-20PMD/1 TM 55-1510-204-20PMI/1 TM 55 1510-204-20PMP/1
Inspection	Man-hours <u>1</u> /	Inspection	Man-hours <u>1</u> /
Daily	1.00 (est)	Daily	1.61
Periodic	25.00 (est)	Intermediate	7.41
		Periodic	146.60
UH-1B	TM 55-1520-219-PMP TM 55-1520-219-PMI TM 55-1520-219-PMP	U-1A	TM 55-1510-205-20PMD TM 55-1510-205-20PMI TM 55-1510-205-20PMP
Inspection	Man-hours <u>1</u> /	Inspection	Man-hours <u>1</u> /
Daily	1.00/1.40	Daily	0.47
Intermediate	3.10/5.70	Intermediate	1.31
Periodic	60.00/86.50	Periodic	48.87
UH-1C,M	TM 55-1520-220-PMD TM 55-1520-220-PMI TM 55-1520-220-PMP	U-6A	TM 55-1510-203-20PMD TM 55-1510-203-20PMI TM 55-1510-203-20PMP
Inspection	Man-hours <u>1</u> /	Inspection	Man-hours <u>1</u> /
Daily	1.00/1.40	Daily	0.41
Intermediate	3.10/5.70	Intermediate	0.91
Periodic	60.00/86.50	Periodic	39.44
UH-1D,H	TM 55-1520-210-PMD TM 55-1520-210-PMI TM 55-1520-210-PMP	U-8	TM 55-1510-201-20PMD TM 55-1510-201-20PMI TM 55-1510-201-20PMP
Inspection	Man-hours <u>1</u> /	Inspection	Man-hours <u>1</u> /
Daily	1.50	Daily	0.50
Intermediate	5.60	Intermediate	1.78
Periodic	80.40	Periodic	68.49
O-1	TM 55-1510-202-20PMD TM 55-1510-202-20PMI TM 55-1510-202-20PMP	U-10A	AF T.O. 1U-10A-6
Inspection	Man-hours <u>1</u> /	Inspection	Man-hours <u>1</u> /
Daily	0.52	Daily	0.45
Intermediate	1.01	Intermediate	1.05
Periodic	40.70	Periodic	44.00
OV-1A,B,C	TM 55-1510-204-20PMD TM 55-1510-204-20PMI TM 55-1510-204-20PMP	U-21A	TM 55-1510-209-20PMD TM 55-1510-209-20PMI TM 55-1510-209-20PMP
Inspection	Man-hours <u>1</u> /	Inspection	Man-hours <u>1</u> /
Daily	1.61	Daily	1.9
Intermediate	7.41	Intermediate	Not Available
Periodic	146.60	Periodic	Not Available

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2-41. Aircraft Inspections (CONT).

AIRCRAFT	TM
TH-55A	Commercial Maintenance Manual
Inspection	Man-hours <u>1</u> /
Daily	0.40
Intermediate	1.00
Periodic	25.00

1/Inspection man-hours are based on world-wide average and do not include unscheduled maintenance.

2/Based on RVN data from period covering Oct. 65-67 12th P.E. averaged 2000 MH each.

Source: AMSAV-R-E

Section VI. FUEL AND OIL

2-42. Fuel and Oil Analysis.

TYPE AIRCRAFT	FUEL			OIL		
	GRADE <u>1/</u>	COST PER GAL <u>2/</u>	CONSUMPTION GAL/CRUISE HR	MIL-L- SPECIFI- CATION <u>1/</u>	COST PER QT <u>3/</u>	CONSUMPTION QT/CRUISE HR
AH-1G	JP-4/5	\$0.104	97.0	7808	\$1.00	1.2
CH-34C	115/145	0.170	97.0	22851	0.21	5.16
CH-47A	JP-4	0.104	452.0	23699	1.00	4.0
CH-47B	JP-4/5	0.104	452.0	23699	1.00	4.0
CH-47C	JP-4/5	0.104	450.0	23699	1.00	4.0
CH-54A	JP-4/5	0.104	470.0	23699	1.00	0.40
CH-54B	JP-4/5	0.104	470.0	23699	1.00	0.40
OH-6A	JP-4/5	0.104	29.0	23699	1.00	0.20
OH-13H	115/145	0.170	16.7	22851	0.21	0.48
OH-13S	115/145	0.170	19.7	22851	0.21	0.48
OH-23D	115/145	0.170	24.02	22851	0.21	0.48
OH-23F/G	115/145	0.170	30.5	22851	0.21	0.48
OH-58A	JP-4	0.104	29.0	23699	1.00	0.20
UH-1B/C	JP-4/5	0.104	97.0	23699	1.00	0.40
UH-1D	JP-4/5	0.104	97.0	23699	1.00	0.40
UH-1H/M ...	JP-4	0.104	97.0	23699	1.00	0.40
TH-13	115/145	0.170	20.5	22851	0.21	0.48
TH-55A	115/145	0.170	10.0	22851	0.21	1.00
O-1D/G	115/145	0.170	9.0	22851	0.21	0.29
O-1E	115/145	0.170	8.7	22851	0.21	0.29
U-1A	115/145	0.170	31.0	22851	0.21	2.20
U-6A/RU-6A ..	115/145	0.170	19.5	22851	0.21	1.10
U-8D/RU-8D ..	115/145	0.170	31.4	22851	0.21	1.28
U-8F	115/145	0.170	30.0	22851	0.21	1.28

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2-42. Fuel and Oil Analysis (CONT).

TYPE AIRCRAFT	FUEL			OIL		
	GRADE <u>1</u> /	COST PER GAL <u>2</u> /	CONSUMPTION GAL/CRUISE HR	MIL-L- SPECIFI- CATION <u>1</u> /	COST PER QT <u>3</u> /	CONSUMPTION QT/CRUISE HR
U-8G	115/145	0.170	31.4	22851	0.21	1.28
U-10A	115/145	0.170	17.0	22851	0.21	0.44
U-21A	JP-4/5	0.104	107.0	23699	1.00	0.20
OV-1A	JP-4/5	0.104	190.0	23699	1.00	0.80
OV-1B	JP-4/5	0.104	190.0	23699	1.00	0.80
OV-1C w/L-15	JP-4/5	0.104	190.3	23699	1.00	0.80
OV-1D	JP-4/5	0.117	190.3	23699	1.00	0.80
T-41B	115/145	0.170	6.1	22851	0.21	0.36
T-42A	115/145	0.170	27.6	22851	0.21	2.00

NOTE: Fuel consumption rate is based on 75% normal rated power. Oil consumption rates do not include the oil used during scheduled oil change. The scheduled oil change intervals are established by local theatre commander. If a 100-hour oil change interval is established, the above oil consumption rates can be multiplied by 150 for turbine engine powered aircraft or by 110 for reciprocating engine powered aircraft to obtain the approximate quantity of oil used (consumption and drain) for each 100 hours of operation. If oil change intervals other than 100 hours are established, different factors must be used. For example, the CH-47B has an oil consumption rate of 4.0 quarts/hour, 150 times 4.0 equals 600 quarts of oil that would be used (consumption and drain) for a 100 hour drain period.

Source: AMSAV-R-E

DATA SOURCE: 1/TB 55-9150-200-25, Engine and Transmission Oils, Fuels, and Additives for Army Aircraft.

2/AFLC CMAL No. 70-2, Standard prices for Aviation Fuels.

3/Federal Supply Catalog, C-ML-A, Army Management Data List, and DSA Petroleum Center.

Section VII. MAINTENANCE MAN - HOURS

2-43. Total Direct and Indirect Maintenance Man - Hour per Flight Hour.

TYPE AIRCRAFT	ORGANIZA- TIONAL MAINT	DS MAINT	GS MAINT	TOTAL
AH-1G	4.05	2.62	2.18	8.85
CH-34	8.60	9.72	6.58	24.89
CH-47A	12.73	10.74	7.85	31.32
CH-47B	12.32	8.36	6.43	27.10
CH-47C	11.30	12.31	8.85	32.45
CH-54	17.81	7.85	5.66	31.32
OH-6A	2.25	2.81	.67	5.74
OH-13	2.65	2.20	1.78	6.62
OH-23	2.07	2.52	3.09	7.69
OH-58A	2.25	2.81	.67	5.74
UH-1B/C/M	3.35	2.79	2.30	8.43
UH-1D/H	3.25	2.41	2.02	7.67
O-1	2.20	.74	.60	3.54
OV-1A	6.75	5.84	3.93	16.52
OV-1B	5.47	2.83	2.03	10.33
OV-1C	5.53	3.15	2.23	10.91
U-1/RU-1 . . .	5.14	3.49	2.53	11.16
U-6/RU-6 . . .	4.62	2.67	1.89	9.18
U-8/RU-8 . . .	5.73	3.19	1.62	10.54
U-10	2.20	.74	.60	3.54
U-21/RU-21 . .	4.19	2.34	1.51	8.04

NOTE: The above maintenance man-hour per flight hour factors includes both direct and indirect labor. Indirect labor is 0.4 times (40%) direct labor.

These factors do not include avionics and weapons systems maintenance manhours.

Source: AMSAV-L-FM

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2-44. Direct and General Support Aviation Maintenance Units.

UNIT	PRODUCTIVE MAINTENANCE MAN-HOURS PER MONTH (BASED ON 200-HR PRODUCTION/MAN/MO)
55-89 Trans Acft Maint Company, Inf Division (Direct Support).....	9,400
55-99 Trans Acft Maint Company, Abn Division (Direct Support).....	9,400
55-407 Trans Acft M & S Company, Airmobile Division (Direct Support).....	34,340
55-424 Trans Acft Maint Company, Armd or Inf Div (Mech) (Direct Support).....	4,600
55-457 Trans Acft Direct Support Company.....	21,600
55-458 Trans Acft Maintenance General Support Company.....	29,800
55-570 Aircraft Maint Teams	
Team KA Acft Rep Aug DS.....	400
Team KB Acft Comp Rep DS.....	400
Team KC Acft DS Det Aug.....	(Non-prod maint & sup)
Team KD Acft DS Det Small.....	3,800
Team KE Acft DS Det Medium.....	6,800
Team KF Medium Cargo Helicopter Direct Support Detachment.....	10,200

NOTE: The factors reflected on the charts are considered direct production type factors which include "wrench turning" or actual "touch time" on the aircraft. They do not include indirect production time, such as alert duty, supervision, maintenance administration, setup time, technical or proficiency training, parts chasing, etc. Even though the maintenance factors shown are valid for direct production man-hour requirements, indications resulting from current studies show that a ratio of 0.4 hours of indirect production labor to each hour of direct production labor should be applied to determine direct support production man-hour requirements. The total direct and indirect productive man-hours per flight hours is therefore in the order of 1.4 times the direct production requirements. The factor (1.4 to 1) is based on extensive field research including on-site inspections of units in Europe, Korea, Japan, and Vietnam. For general support aircraft maintenance, initial estimates indicate that a factor of 1.5 to 1 is required to compensate for the indirect production maintenance man-hours factor and that further study may prove this factor to be even higher. However, based on data available at this time, the 1.4 factor is used for both direct and general support estimates for maintenance man-hour requirements.

Source: AMSAV-L-NA

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SECTION VIII. MAINTENANCE CATEGORIES

2-45. The Four Categories of Maintenance are:**a. Organization:**

Functions and repairs within the capabilities of authorized personnel, skills, tools and test equipment as prescribed in appropriate TOE's or TD's.

b. Direct Support

Repair of end items or unserviceable assemblies in support of using organizations on a return to user basis.

c. General Support

Repair or overhaul materiel to required maintenance standards in a ready to issue condition based upon applicable supported Army area supply requirements.

d. Depot

Provide for the repair/overhaul of materiel beyond the capability of general support maintenance organizations.

2-46. Installations with Capabilities to Perform Aeronautical Depot Maintenance.

ARMY DEPOT	LOCATION
ARADMAC	Corpus Christi, Texas
New Cumberland	Harrisburg, Pennsylvania
Sharpe	Lathrop, California
*Atlanta	Forrest Park, Georgia
*Ft. Hood	Killeen, Texas
*Ft. Riley	Manhattan, Kansas

*Limited Capabilities

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CHAPTER 4

COSTS

Section I. ARMY AIRCRAFT MAINTENANCE AND OPERATING COSTS PER FLYING HOUR

4-1. Army Aircraft Direct Flying Hour Costs. (Including Maintenance Labor, Parts, POL Flight Crew and Utilization Rate – To Be Published)

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4-2. Program 2 Flying Hour Cost Factors.

(\$ per FH)

AIRCRAFT	WORLDWIDE LESS RVN			R V N		
	PARTS ASF	POL	TOTAL	PARTS ASF	POL	TOTAL
<u>Fixed Wing</u>						
O-1	NA	NA	NA	13	2	15
OV-1	71	14	85	86	14	100
U-1	29	6	35	39	6	45
U-6	21	4	25	36	4	40
U-8	22	6	28	27	6	33
U-10	24	3	27	NA	NA	NA
U-21	27	7	34	32	7	39
T-41	20	1	21	NA	NA	NA
T-42	23	5	28	NA	NA	NA
<u>Rotary Wing</u>						
OH-6	26	4	30	36	4	40
OH-58	26	4	30	33	4	37
OH-13/23	16	3	19	NA	NA	NA
CH-34	76	14	90	NA	NA	NA
CH-47	147	33	180	197	33	230
CH-54	191	59	250	371	59	430
UH-1	33	7	40	43	7	50
AH-1G	37	8	45	48	8	56
TH-13T	16	3	19	NA	NA	NA

NA – Not applicable

Source: DA-COMPT-CA

Section II. AIRCRAFT UNIT FLYAWAY COSTS

4-3. Rotary Wing Unit Price. ^{1/}

HELICOPTER	FEDERAL STOCK NUMBER	LINE ITEM NUMBER	TYPE	STANDARD PRICE ^{2/}
AH-1G	1520-999-9821	K29660	Attack	471,630
CH-34C	1520-633-6831	K30254	Cargo Transport	376,296
CH-47A	1520-633-6836	K30378	Cargo Transport	990,717
CH-47B	1520-990-2941	K30383	Cargo Transport	1,063,448
CH-47C	1520-871-7308	NVAL	Cargo Transport	1,674,561
CH-54A	1520-964-9601	K30515	Cargo Transport	2,134,466
CH-54B	1520-113-5776	K30515	Cargo Transport	1,990,812
OH-6A	1520-918-1523	K30645	Observation	109,221
OH-13H	1520-574-7952	K30719	Observation	48,369
OH-13S	1520-973-1227	K30746	Observation	55,640
OH-23D	1520-591-0564	K30917	Observation	48,773
OH-23F	1520-893-2726	K30944	Observation	75,341
OH-23G	1520-973-1226	K30961	Observation	53,963
OH-58A	1520-169-7137	K31042	Observation	99,302
UH-1B	1520-713-9912	K31749	Utility	244,760
UH-1C	1520-997-8862	K31767	Utility	224,415
UH-1D	1520-859-2670	K31786	Utility	237,504
UH-1H	1520-087-7637	K31795	Utility	244,345
UH-1M	1520-809-2631	Z33550	Utility	247,758
TH-13T	1520-760-3333	K29797	Basic Instrument Trainer	62,700
TH-55A	1520-758-0289	K31153	Primary Trainer	35,590

^{1/} Costs of armament systems not included. Refer to chapter 2.^{2/} Published in Federal Supply Catalog/C-ML-A, Army Management Data List.

Source: AMSAV-C-B

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4-4. Fixed Wing Unit Price.^{1/}

AIRCRAFT	FEDERAL STOCK NUMBER	LINE ITEM NUMBER	TYPE	STANDARD PRICE ^{2/}
O-1D	1510-903-0236	A30111	Observation	37,214
O-1E	1510-591-0565	A30121	Observation	33,504
O-1F	1510-967-7653	A30130	Observation	36,614
O-1G	1510-924-8466	A30132	Observation	34,845
U-1A	1510-508-1494	A30621	Utility	122,740
U-6A	1510-508-0604	A30671	Utility	99,529
U-8D	1510-574-7938	A30721	Utility	115,250
U-8F	1510-701-2233	A30821	Utility	144,593
U-8G	1510-912-4084	A30831	Utility	114,687
RU-6A	1510-950-6962	A30457	Reconnaissance Utility	99,529
RU-8D	1510-945-9998	A30465	Reconnaissance Utility	295,250
	1510-769-3114	A30521	Reconnaissance Utility APS85	295,250
U-10A	1510-964-9780	A30971	Utility STOL	55,824
U-21A	1510-933-8223	A30946	Utility	348,844
RU-21A	1510-587-3375	Z04566	Reconnaissance Utility	587,004
OV-1A	1510-715-9378	A30171	Observation STOL	866,555
OV-1B	1510-715-9379	A30221	Observation STOL	976,437
OV-1C	1510-715-9380	A30271	Observation STOL	1,058,540
OV-1D	1510-869-3654	A30296	Observation STOL	2,033,066
T-41B	1510-929-1012	A30053	Trainer, Flight	16,200
T-42A	1510-872-7908	K30596	Trainer, Instrument	55,072

^{1/} Cost of armament systems not included. Refer to chapter 2.^{2/} Published in Federal Supply Catalog/C-ML-A, Army Management Data List.

Source: AMSAV-C-B

4-5. Avionics Estimated Maintenance Cost Factors.

AVIONICS EQUIPMENT OR SYSTEM	ESTIMATED LABOR COST (\$)				ESTIMATED PARTS COST (\$)		
	ORG	FIELD	HEAVY	DEP	FIELD	HEAVY	DEP
A-25A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A-339D-1	5.61	13.46	20.20	224.40	8.98	13.46	39.27
AM-3209/ASN	1.17	NR	NR	49.25	NR	NR	6.35
AM-6279/ASW	60.00	N/A	N/A	N/A	N/A	N/A	N/A
AM-6280/ASW	6.00	N/A	N/A	N/A	N/A	N/A	N/A
AM-12049	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AN/AAS-14()	250.00	NR	NR	10000.00	NR	NR	1750.00
AN/AAS-24()	29.00	NR	NR	1165.45	NR	NR	203.95
AN/AAS-29	100.00	NR	NR	4000.00	NR	NR	700.00
AN/ADR-6	24.00	58.19	87.28	969.80	38.79	58.19	169.72
AN/AJA-5()	12.50	30.00	45.00	221.38	26.00	30.00	100.00
AN/AKT-18	11.00	NR	NR	5625.00	NR	NR	1200.00
AN/ALQ-67	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AN/ALQ-80	300.00	720.00	1080.00	12000.00	480.00	720.00	2100.00
AN/APN-22	8.00	19.58	29.37	443.13	13.06	19.58	65.28
AN/APN-158()	59.00	141.05	211.57	1978.50	94.03	141.05	428.52
AN/APN-171V()	27.50	66.00	99.00	1100.00	44.00	66.00	192.50
AN/ARC-111	5.00	11.99	17.98	450.50	7.99	11.99	41.60
AN/ARC-114	6.73	16.14	24.21	375.00	10.76	16.14	90.00
AN/ARC-115	6.35	15.00	22.50	375.00	10.00	15.00	90.00

Section III. AVIONICS COSTS

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4-5. Avionics Estimated Maintenance Cost Factors (CONT).

AVIONICS EQUIPMENT OR SYSTEM	ESTIMATED LABOR COST (\$)				ESTIMATED PARTS COST (\$)		
	ORG	FIELD	HEAVY	DEP	FIELD	HEAVY	DEP
AN/ARC-116	5.65	13.56	20.34	375.00	9.04	13.56	90.00
AN/ARC-131	15.28	36.67	55.01	611.30	24.45	36.67	106.98
AN/ARC-134()	12.31	29.54	44.32	492.40	19.70	29.54	86.17
AN/ARN-6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AN/ARN-30()	8.90	20.50	30.74	604.38	13.60	20.50	111.02
AN/ARN-32	1.03	2.46	3.69	41.00	1.64	2.46	7.18
AN/ARN-59	6.65	15.96	23.94	171.88	10.64	15.96	20.00
AN/ARN-82	9.37	22.49	33.73	374.80	14.99	22.49	65.59
AN/ARN-83	8.19	19.66	29.48	604.38	13.10	19.66	60.92
AN/ARN-89	10.89	26.14	39.20	562.50	17.42	26.14	110.00
AN/ART-41A	30.00	NR	NR	1200.00	NR	NR	210.00
AN/ASH-19	27.50	66.00	99.36	1100.00	44.16	66.00	192.50
AN/ASH-23	17.57	42.16	63.23	702.70	28.10	42.16	122.97
AN/ASN-13	11.07	26.56	39.83	375.63	17.70	26.56	79.60
AN/APR-25(V)	64.00	153.00	229.57	2550.00	102.00	153.00	446.25
AN/APR-26(V)	12.50	30.00	45.00	5.00	20.00	30.00	87.50
AN/APR-36	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AN/APR-37	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AN/APS-94()	9.00	NR	NR	353.66	NR	NR	61.89
AN/APX-44()	11.00	26.64	39.96	409.63	17.76	26.64	40.34
AN/APX-72	15.50	37.20	55.80	620.00	24.80	37.20	159.36
AN/ARA-31	.89	2.14	3.20	35.60	1.42	2.14	6.23
AN/ARA-56	.17	.40	.59	6.59	.26	.40	1.15

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4-5. Avionics Estimated Maintenance Cost Factors (CONT).

AVIONICS EQUIPMENT OR SYSTEM	ESTIMATED LABOR COST (\$)				ESTIMATED PARTS COST (\$)		
	ORG	FIELD	HEAVY	DEP	FIELD	HEAVY	DEP
AN/ARC-44	9.00	21.26	31.88	814.13	14.17	21.26	61.24
AN/ARC-45	19.00	45.60	68.40	320.10	30.40	45.60	125.00
AN/ARC-54	23.50	56.12	84.11	364.38	37.38	56.12	349.36
AN/ARC-51BX	21.00	50.74	76.46	329.37	33.98	50.74	319.16
AN/ARC-55()	11.20	26.88	40.32	466.38	17.92	26.88	67.24
AN/ARC-60()	5.80	13.92	20.88	442.50	9.28	13.92	25.95
AN/ARC-73()	10.09	24.22	36.32	1218.13	16.14	24.22	177.56
AN/ARC-102	27.80	66.72	106.08	1194.50	44.48	66.72	220.29
AN/ASN-23	38.40	92.16	138.24	1250.00	61.44	92.16	500.00
AN/ASN-33	9.05	81.71	122.56	1361.80	54.47	81.71	238.32
AN/ASN-43	14.11	N/A	N/A	564.20	N/A	N/A	98.74
AN/ASN-62	20.00	48.00	72.00	800.00	32.00	48.00	140.00
AN/ASN-64	181.62	N/A	N/A	7264.60	N/A	N/A	1271.31
AN/ASN-76	46.32	N/A	N/A	1852.80	N/A	N/A	324.24
AN/ASN-86	719.25	1726.20	2589.30	28770.00	1150.80	1726.20	5034.75
AN/ASQ-132	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AN/ASW-12(V)	126.36	303.25	454.88	3075.00	202.17	303.25	1280.00
AN/ASW-29	64.10	153.84	230.76	2564.00	102.56	153.84	448.70
AN/AYA-5	155.00	NR	NR	4175.00	NR	NR	1240.00
AN/AYA-10	355.74	853.76	1280.64	14294.40	569.18	853.76	2490.15
AN-3151-2	.26	.77	1.03	N/A	.51	.77	N/A
AN-3154-1A	.26	.77	1.03	N/A	.51	.77	N/A
AN-3533	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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4-5. Avionics Estimated Maintenance Cost Factors (CONT).

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AVIONICS EQUIPMENT OR SYSTEM	ESTIMATED LABOR COST (\$)				ESTIMATED PARTS COST (\$)		
	ORG	FIELD	HEAVY	DEP	FIELD	HEAVY	DEP
AS-580A/ARN-30	.16	.38	.57	6.38	.26	.38	1.12
AS-1304/ARN	.72	1.73	2.60	21.25	1.16	1.73	2.00
AS-1520/APN-158	9.01	21.62	32.45	296.88	14.42	21.62	72.08
AS-1703/AR	.21	.50	.76	15.63	.34	.50	1.52
AS-1869/ARN	.99	2.38	3.56	39.60	1.58	2.38	6.93
AS-1870/ARN	1.44	3.46	5.18	57.60	2.30	3.46	10.08
AS-1922A/ARC	.40	.96	1.43	25.00	.64	.96	3.20
AS-2042/ARC	1.59	4.06	6.08	71.25	2.70	4.06	8.40
AS-2285/ARC	3.48	8.34	12.51	139.00	5.56	8.34	24.33
AT-134	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AT-450()/ARC	.17	.40	.60	6.25	.26	.40	.80
AT-454/ARC	.62	1.48	2.22	24.13	.98	1.48	4.72
AT-640A/ARN	.38	.90	1.35	15.00	.60	.90	2.63
AT-701()/AR	.09	.22	.33	11.88	.15	.22	.92
AT-741/A	.14	NR	NR	41.76	NR	NR	7.31
AT-780/ARN	1.05	NR	NR	53.13	NR	NR	4.86
AT-805/ARN	.07	.17	.26	2.84	.11	.17	.50
AT-884()/APX	.14	.34	.50	34.00	.22	.34	2.04
AT-1108/ARC	.77	1.85	2.77	68.63	1.23	1.85	4.32
BB-432/A	.93	2.79	3.72	68.75	1.86	2.79	12.32
BB-433/A	1.55	4.65	6.20	62.50	3.10	4.65	6.56
BB-434/A	1.41	4.23	5.64	93.75	2.82	4.23	14.40
BB-641A/A	2.12	6.35	8.46	118.44	4.23	6.35	18.19

4-5. Avionics Estimated Maintenance Cost Factors (CONT).

AVIONICS EQUIPMENT OR SYSTEM	ESTIMATED LABOR COST (\$)				ESTIMATED PARTS COST (\$)		
	ORG	FIELD	HEAVY	DEP	FIELD	HEAVY	DEP
BB-649/A	1.62	4.86	6.48	90.72	3.24	4.86	13.93
BB-676/A	2.02	6.05	8.06	112.84	4.03	6.05	17.33
BB-678/A	2.25	6.75	9.00	126.00	4.50	6.75	19.35
C-14	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C-1611()/AIC	1.58	3.78	5.67	102.63	2.52	3.78	8.45
C-4209/ARC	.16	.37	.56	46.25	.25	.37	5.00
C-6533()/ARC	1.00	2.40	3.60	50.00	1.60	2.40	13.00
C-7266/ASW-29	3.45	8.28	12.42	138.00	5.52	8.28	24.15
C-7269/ASW	.88	2.10	3.15	35.00	1.40	2.10	6.13
C-8157/ARC	7.00	N/A	N/A	51.88	N/A	N/A	12.00
C-8476/ASW	9.00	21.60	32.40	360.00	14.40	21.60	63.00
C-8477/ASW	6.00	18.00	27.00	300.00	12.00	18.00	52.50
C-8478/ASW	2.50	6.00	9.00	100.00	4.00	6.00	17.50
CD-4(ARC)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CN-405/ASN	2.63	6.30	9.45	78.13	4.20	6.30	1.68
CN-811()/ASN	7.48	17.95	26.93	574.38	11.97	17.95	20.00
CN-1072/AJN	.45	NR	NR	18.00	NR	NR	3.15
CN-1179/ASW	11.25	27.00	40.50	450.00	18.00	27.00	78.75
CN-1314()/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CN-1325/ASW	5.00	12.00	18.00	200.00	8.00	12.00	35.00
CU-435	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CU-942()/ARC-54	1.86	4.46	6.69	74.35	2.97	4.46	13.01
CU-991()/AR	5.93	14.22	21.33	423.75	9.48	14.22	60.52

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4-5. Avionics Estimated Maintenance Cost Factors (CONT).

AVIONICS EQUIPMENT OR SYSTEM	ESTIMATED LABOR COST (\$)				ESTIMATED PARTS COST (\$)		
	ORG	FIELD	HEAVY	DEP	FIELD	HEAVY	DEP
CU-1658A/ARC	13.00	NR	NR	341.63	NR	NR	60.00
CU-1794()/ARC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CU-1796()/ARC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CU-1893()/ARC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CY-1894()/ARC	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CV-1275()/ARN	2.72	6.52	9.77	204.75	4.34	6.52	75.89
DG-401	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DMN44.1	.41	.99	1.48	16.48	.66	.99	2.88
DT-309/AJN	4.75	NR	NR	190.00	NR	NR	33.25
DY-86/ARN-30	.28	.66	.99	16.00	.44	.66	1.90
F-726/AR	.16	.39	.58	23.75	.26	.39	1.52
H-101()/U	.38	.91	1.37	25.38	.61	.91	10.52
ID-48()/ARN	1.25	NR	NR	98.63	NR	NR	7.40
ID-250()/ARN	.82	NR	NR	77.63	NR	NR	13.00
ID-387/ARN	.27	NR	NR	10.60	NR	NR	1.86
ID-453/ARN-30	2.18	NR	NR	126.13	NR	NR	53.60
ID-637/ARN	.38	NR	NR	48.00	NR	NR	3.00
ID-663()/ARN	2.90	NR	NR	159.38	NR	NR	40.00
ID-718/ARN	1.04	NR	NR	114.88	NR	NR	8.52
ID-998()/ASN	7.78	NR	NR	140.25	NR	NR	49.03
ID-1347/ARN-82	1.75	NR	NR	118.13	NR	NR	26.79
ID-1351()/A	7.31	NR	NR	287.50	NR	NR	65.00
ID-1720/ASW	N/A	NR	NR	N/A	NR	NR	N/A

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4-5. Avionics Estimated Maintenance Cost Factors (CONT).

AVIONICS EQUIPMENT OR SYSTEM	ESTIMATED LABOR COST (\$)				ESTIMATED PARTS COST (\$)		
	ORG	FIELD	HEAVY	DEP	FIELD	HEAVY	DEP
IN-14	N/A	NR	NR	N/A	NR	NR	N/A
J-2	7.00	NR	NR	661.11	NR	NR	100.91
KA-30A()	44.26	88.52	132.78	871.63	106.22	177.00	204.00
KA-60()	45.50	91.00	136.50	1625.00	109.20	182.00	600.00
KA-76()	.80	1.59	2.38	22.26	1.91	3.18	8.11
KIT-1A/TSEC	25.00	50.00	90.00	1000.00	40.00	100.00	175.00
KS-61A	125.00	250.00	375.00	4687.50	300.00	500.00	1625.00
KS-113()	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LS-38()	106.93	213.86	320.79	1010.00	256.63	427.72	800.00
LS-59()	141.03	282.05	423.08	5312.50	338.46	564.10	1830.00
M-40A	.05	.11	.16	1.80	.07	.11	.32
MA-1()	38.98	93.54	140.31	1559.00	62.23	93.54	272.83
MC-1	2.95	NR	NR	94.25	NR	NR	26.00
MD-1()	4.89	NR	NR	661.63	NR	NR	58.80
MD-736/A	.75	1.80	2.70	39.38	1.20	1.80	9.00
MT-1142()/ARC	.03	.07	.11	1.20	.05	.07	N/A
MT-1719()/AR	.20	.47	.70	7.80	.31	.47	1.37
MT-2292/AR	.05	.12	.18	2.00	.08	.12	.35
MT-2641/ARC-94	.58	1.36	2.04	22.68	.91	1.36	3.97
MT-3772()/A	.18	.43	.65	7.20	.29	.43	1.26
MT-3802/ARC	.15	.36	.54	50.00	.24	.36	7.00
MX-1646/ARC	.11	.27	.41	45.38	.18	.27	.81
MX-8611/ASN	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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4-5. Avionics Estimated Maintenance Cost Factors (CONT).

AVIONICS EQUIPMENT OR SYSTEM	ESTIMATED LABOR COST (\$)				ESTIMATED PARTS COST (\$)		
	ORG	FIELD	HEAVY	DEP	FIELD	HEAVY	DEP
PP-2792/ARN-30D	.30	.72	1.08	64.50	.48	.72	15.70
PP-6508	1.33	3.18	4.77	53.00	2.12	3.18	9.28
PU-542()/A	1.31	3.15	4.72	108.75	2.10	3.15	17.04
PU-543()/A	1.09	2.06	3.91	68.13	1.74	2.60	121.81
PU-544()/A	2.29	5.50	8.24	81.38	3.66	5.50	36.40
PU-545()/A	3.18	7.63	11.45	116.88	5.09	7.63	6.50
R-509()/ARC	1.77	4.25	6.37	89.13	2.83	4.25	8.60
R-511/ARC	1.68	4.02	6.03	118.50	2.68	4.02	13.40
R-844()/ARN-58	7.00	16.80	25.20	454.63	11.20	16.80	56.00
R-1041()/ARN	.60	1.44	2.16	96.13	.96	1.44	9.33
SB-329/AR	.78	1.87	2.81	75.25	1.25	1.87	19.04
SI-07F	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SN-410()/ASW-29	.10	.25	.37	4.12	.16	.25	.72
SN-441/ASW	.38	.90	1.35	15.00	.60	.90	2.63
SN-442/ASW	8.00	19.20	28.80	320.00	12.80	19.20	56.00
T-363()/ARC	.75	NR	NR	48.00	NR	NR	7.06
T-366()/ARC	.72	1.73	2.59	160.63	1.15	1.73	12.85
T-611/ASN	.48	NR	NR	18.95	NR	NR	3.32
T-992/A	5.80	NR	NR	232.00	NR	NR	40.60
TS-1843/APX	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TSEC/KY-28	26.10	62.64	93.96	1044.00	41.76	62.64	18.27
TW-333/ASH-19	N/A	N/A	N/A	N/A	N/A	N/A	N/A

4-5. Avionics Estimated Maintenance Cost Factors (CONT).

N/A -- Not Available As Of This Printing

NR -- Maintenance And/Or Repair Parts Not Authorized At This Category

NOTE: Estimated maintenance cost factor for a given category of maintenance is based upon the total cost estimated to maintain an item and/or system for FY 1970 as amortized on a pro-rata basis for each of such items within the Army system for that year.

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Labor Cost <u>2</u> /					Parts Cost <u>3</u> /				
ACFT/WPN SUBSYSTEM	ORG MAINT	DS MAINT	GS MAINT	DEP MAINT	ORG MAINT	DS MAINT	GS MAINT	DEP MAINT	TOTAL MAINT COST
UH-1B/C M5	3,920	2,107	1,379	15,881	197	788	253	1,576	26,101
AH-1G M18A1	1,960	1,309	952	9,895	148	1,220	406	1,922	17,812
UH-1B/C/M M21	9,800	2,779	1,344	15,858	230	3,370	1,072	2,987	37,440
UH-1D/H M23	735	294	105	582	48	390	130	614	2,898
CH-47A/B/C M24	735	294	105	262	41	336	112	529	2,414
OH-6A OH-58A XM27E1	5,880	1,736	833	6,565	285	2,354	785	3,718	22,156
AH-1C M28A1	14,700	3,584	1,379	19,630	1,213	10,313	3,336	15,470	69,625
AH-1G XM28E1	14,700	3,584	1,379	19,630	1,213	10,313	3,336	15,470	69,625
AH-1G XM35	3,920	1,407	518	8,580	750	4,950	1,500	7,800	29,425
CH-47A/B/C XM41	735	294	105	593	43	180	66	257	2,273

4-6. Airborne Armament Maintenance Costs. 1/(CONT)

Labor Cost <u>2/</u>					Parts Cost <u>3/</u>				
ACFT/WPN SUBSYSTEM	ORG MAINT	DS MAINT	GS MAINT	DEP MAINT	ORG MAINT	DS MAINT	GS MAINT	DEP MAINT	TOTAL MAINT COST
UH-1D/H XM59	1,960	511	140	1,522	57	237	86	380	4,893
UH-1B/C/M XM156	980	252	126	2,340	31	255	85	402	4,471

1/-Maintenance costs are estimates because TM38-750 maintenance data has been waived for SEA.

2/-Labor costs are estimated Direct labor rates. Overhead rates not included.

3/-Parts costs are from engineering estimates. Consumption data not available.

Source: AMSWE-SMM-AR

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APPENDIX A

REFERENCES

ARMY REGULATIONS (AR)

- 95-70 Army Aviation Planning Manual.
- 320-5 Dictionary of United States Army Terms.
- 320-50 Authorized Abbreviations and Brevity Codes.

FIELD MANUALS (FM)

- 1-5 Army Aviation Organization and Employment.
- 1-100 Army Aviation Utilization.
- 1-105 Army Aviation Techniques and Procedures.
- 21-5 Military Training.
- 21-6 Techniques of Military Instructions.
- 21-30 Military Symbols.
- 21-60 Visual Signals.
- 55-15 Transportation Reference Data.
- 55-46 Army Aviation Transport Services and Units in the Field Army.
- 57-35 Airmobile Operations.
- 101-10 Staff Officers' Field Manual: Organization, Technical, and Logistical Data (Part I – Unclassified).

TECHNICAL MANUALS (TM)

- 55-450-8 Air Transport of Supplies and Equipment: External-Transport Procedures.
- 55-450-9 Air Transport of Supplies and Equipment: Internal-Transport Procedures.
- 55-1510 series Operator's Manual (Fixed Wing Aircraft).
- 55-1520 series Operator's Manual (Rotary Wing Aircraft).
- 57-210 Air Movement of Troops and Equipment.

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